North East Forest Alliance Submission the Federal Inquiry into: The effectiveness of threatened species and ecological communities' protection in Australia

Prepared by Dailan Pugh for NEFA, December 2012

NEFA spent considerable time preparing a submission to the Inquiry into the Australian forestry industry (North East Forest Alliance, March 2011), a large part of our submission dealt with the environmental impacts of forestry and the impacts on threatened species and ecosystems which were relevant to their terms of reference. We were thus dismayed when they chose to totally ignore the evidence we presented because it did not suit their distinct pro-industry biases. That supposed inquiry was a disgraceful sham. As a result we can have little faith in the integrity of Commonwealth parliamentary inquires.

NEFA has not had time or resources to make a comprehensive submission, particularly as our previous experience was that the time we spent on our submission, and attending a hearing, was a total waste of time. Similarly the deadline has not allowed a final edit.

This submission particularly focuses on north-east NSW (the CRA regions of Upper and Lower North East NSW), on forests, and on forestry activities. It highlights aspects of threatened species management using specific case studies.

Note that in this report **EPA** refers to the Environment Protection Authority, including in its previous incarnations as the Department of Environment and Climate Change (and Water) (**DECC**(W)) and National Parks and Wildlife Service (**NPWS**). **OEH** refers to the Office of Environment and Heritage.

RECOMMENDATIONS

1. The Inquiry needs to recognise that in NSW the preparation of recovery plans and the identification of critical habitat for threatened species have been actively resisted by OEH and Government. The few recovery plans prepared often fail to identify needed management actions and thus often fail to address the principal threats to the species. Relevant actions in recovery plans are often ignored, even by NSW Government agencies. The recovery planning and critical habitat processes have largely failed due to a lack of commitment to the protection of threatened species.
2. The Inquiry needs to recognise that in north-east NSW the grossly inadequate reserve system and off-reserve reserve management regime is condoned by the NE Regional Forest Agreement and thus exempted from the *Environment Protection and Biodiversity Conservation Act 1999.* The Commonwealth is culpable for the many environmental offences identified herein and their lack of any meaningful oversight is an abrogation of their national and international obligations.
3. The Inquiry needs to recognise that the reserve system in north-east NSW does not satisfy the national reserve targets. Even when informal reserves and values protected by

prescription are counted the reserve system remains grossly deficient. Only 64% of the total area of ecosystems needed to satisfy the ecosystem targets has been reserved and 33% of ecosystems have not met even half their targeted areas. It is most worrying that 52% of fauna species fail to meet the targets set for any of their populations and that only 31% of populations have achieved targets aimed at encompassing viable populations of our most vulnerable species into the reserve system. Flora also fares poorly with 78% of plants not satisfying their targets, and 20% not achieving any of their targets.

4. The inquiry should specifically review the reserve status of federally listed species and ecosystems in north-east NSW in light of identified threats.

5. The inquiry should promote the need to significantly expand the reserve system in north east NSW to provide the needed protection for biodiversity and nationally threatened species, so as to bring it up to national standards.

6. The Inquiry needs to recognise that timber commitments given in the North East RFA are unsustainable and are currently being reassessed by the NSW Government. It is likely that the NSW Government may allow logging of National Parks and other conservation reserves, and reduce logging prescriptions for threatened species

7. The Inquiry needs to ensure that any changes to the reserve outcomes or timber commitments given in the North East Regional Forest Agreement, made between the Commonwealth and NSW in 2000, are subject to review by the Commonwealth to ensure that existing protections for threatened species are maintained or improved.

8. The Inquiry must recognise that the Integrated Forestry Operations Approvals, and their constituent Threatened Species Licences, which underpin the North East Regional Forest Agreement made between the Commonwealth and NSW in 2000, are currently being reviewed in a secretive process by the NSW Government and are expected to significantly weaken already inadequate protection for nationally threatened species.

9. NEFA requests that the Commonwealth intervene in the IFOA review to ensure Commonwealth obligations for threatened species are fully discharged in north-east NSW.

10. NEFA suggests the Inquiry recommends the adoption of performance measures for flora and fauna prescriptions and auditing of their effectiveness in achieving those measures.

11. It is recommended that the Inquiry commission appropriate experts to review the likely effectiveness of prescriptions applied to reduce impacts of logging operations on nationally threatened species in north-east NSW. The review should identify explicit performance measures and auditing requirements.

12. The inquiry needs to recognise that the maintenance of large old hollow-bearing trees in perpetuity is a key requirement for the survival of numerous Australian species, including many species already identified as threatened with extinction.

13. NEFA recommends the Inquiry recognise the current and worsening crisis in the availability of large old trees and the essential resources they provide to numerous fauna species, and recommend the retention and protection of all large old trees (>140 years old) for their biodiversity and heritage values

14. The Inquiry needs to recognise that the current crisis over extensive forested landscapes in the availability of large old trees, and the essential hollows they provide to numerous

species, is worsening as remnant large old trees die or are killed without recruitment trees being available to replace them. The inquiry should identify the tree retention requirements across the range of age classes necessary to provide an adequate stocking of large old trees throughout native forests into the future.

15. Despite retention requirements being specified during some logging operations for the retention of hollow-bearing trees, and recruitments to grow into the hollow-bearing trees to replace them when they die, the achievement of requirements are often grossly inadequate and there appears to be a war of attrition being waged against hollow-bearing trees. The aim should be to retain, maintain or restore hollow-bearing trees and adequate recruits throughout native forests.

16. NEFA considers that in order to provide meaningful protection for Koalas there is a need for enhanced prescriptions in logging operations. It is suggested that the Inquiry recommend a more appropriate approach to Koala conservation in north-east NSW that incorporates the following elements:
    a. All trees with Koalas in them, or evidence of use (scratch marks, scats), must be retained and appropriately buffered.
    b. Fifteen Koala browse trees in every hectare of the net logging area must be retained within all "preferred forest types" for Koalas, unless the EPA determines that surveys by an appropriately trained fauna expert have reliably identified that it is not potential Koala habitat. Retained Koala browse trees must have good crown development, should have minimal butt damage, and should not be suppressed. Mature and late mature trees, >30cm diameter, must be retained as Koala browse trees where available. Where such trees are not available then suitable recruitment trees must be retained.
    c. A Local Koala Management Plan must be prepared and approved by the EPA before undertaking any logging or development within "preferred forest types" for Koalas. The Plan must identify core Koala habitat to be excluded from logging or development and necessary connecting corridors. The plan must be exhibited for public comment.

17. Protection of Koalas in logging operations is dependent upon searches for them and evidence of their presence (i.e. scats) being undertaken ahead of logging. While searches are required on public land they are rarely undertaken with the consequence that Koala High Use Areas are being illegally logged by Forests NSW, even when the supposed regulator is present in the forest.

18. The Inquiry needs to recognise that there is no monitoring of prescriptions applied to supposedly reduce logging impacts on threatened species, and thus no adaptive management. The Inquiry should recommend a monitoring program to assess the impacts of forestry operations on nationally threatened species so as to objectively assess the effectiveness of logging prescriptions intended to mitigate impacts, and identify appropriate improvements.

19. In light of the inadequate protection applied for the endangered Hastings River Mouse on public land, and the lack of any meaningful protection on private land, it is requested that the Inquiry recommend that, in accordance with the Hastings River Mouse Recovery Plan, logging be prohibited within medium and high quality Hastings River Mouse habitat across all tenures, and be appropriately modified within 200m of such habitat. No further reductions

to protections for Hastings River Mouse should be allowed unless part of a justifiable scientific trial overseen by independent experts.

20. The Inquiry needs to recognise that while there are theoretical prescriptions for most threatened plants, they are rarely applied because appropriately experienced botanists are not searching for them ahead of logging. It is suggested that the Inquiry recommend that pre-logging surveys for threatened plants be undertaken by appropriately experienced botanists on all land tenures.

21. The Inquiry needs to recognise that the NSW Fisheries Licence has failed for the past 14 years to provide the intended protection for most threatened fish because Forests NSW does not consider they are required to consider any species unless detailed distribution data is first provided by Fisheries NSW. Requirements for data collation and habitat assessment are treated with contempt. The limited prescriptions required to be applied upstream of threatened fish are often ignored. Threatened fish are ignored in forestry operations on private lands. The Inquiry needs to engage independent experts to identify meaningful prescriptions to be applied for threatened fish.

22. The Inquiry should condemn the opening up of national parks in NSW for recreational shooting as this will increase the direct threat to a number of threatened species and divert limited resources and staff from systematic and prioritorised feral animal control programs and thereby increase the impacts of feral animals on threatened fauna.

23. The Inquiry needs to recognize that logging is facilitating the spread of weeds through our forests and that this is causing the degradation of ecosystems and the loss of habitat for numerous threatened species. The Inquiry needs to recommend that significant weed infestations are identified before logging and rehabilitation works implemented.

24. The Inquiry needs to recognize that Bell Miner Associated Dieback is a major threat to many forest ecosystems and threatened species over large areas of north-east NSW, and appears to be rapidly worsening. Tens of thousands of hectares of forest in north-east NSW are affected and hundreds of thousands of hectares are vulnerable. It is a serious threat that has been procrastinated over for far too long.

25. Forests NSW are targeting Bell Miner Associated Dieback Areas for removal of all healthy remaining trees and then abandoning them to their fate as destroyed ecosystems. The Inquiry is requested to support a sustainable approach to the key threatening process Bell Miner Associated Dieback by recommending an urgent moratorium on logging in and adjacent to BMAD areas until such time as effective rehabilitation strategies for restoration of ecosystem health and threatened species habitat are implemented.

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1. INTRODUCTION

North-eastern NSW, in conjunction with south-eastern Queensland, is known to be nationally and internationally significant for its diversity of plants and animals. This region is the evolutionary hub of the wet sub-tropics with a high number of endemic species. In this region Australia's predominantly northern forest flora and fauna reach their southern limits of distribution and the predominantly southern species reach their northern limits (this species overlap is, in part, referred to as the Macleay-McPherson Overlap). This overlap includes representatives of the Tumbunan, Bassian, Torresian, Irian and Eyrean biotas, and as noted by the NPWS (1994a) *"Nowhere else in Australia do so many zoogeographical influences combine".*

It also needs to be realised that within Australia, the tropical forests of north-east Queensland and the sub-tropical forests of north-eastern NSW/south-eastern Queensland are the principle centres of biodiversity for insects, frogs, birds, and mammals, and together with south-western Western Australia, plants (variously Chippendale 1981, CoA 1996, Covacevich and McDonald 1991, DASET 1992, Debus 1992, Dyne 1991, Martin 1984, NPWS 1994a, NPWS 1994b, Pianka and Schall 1984).

The north-eastern NSW/south-eastern Queensland region supports 35 endemic vertebrate species and is the distributional stronghold for 37 other vertebrates (NPWS 1994a). DASET (1992) note that

some 260 plant species, representing 131 genera and 63 families, and *"numerous invertebrate species",* including many primitive genera, are largely restricted to north-eastern NSW and far south-eastern Queensland.

The forests of north-east NSW have also been identified as being of outstanding value for threatened biodiversity in numerous other assessments, for example they have been identified as part of one of the world's 35 biodiversity hotspots because of north-eastern Australia's exceptional species endemism (at least 1,500 endemic plant species, i.e., 0.5% of all known species) and habitat loss (70% or more of an area's primary vegetation cleared) (Williams *et.al.* 2011).

North east NSW also encompasses part one of one of Australia's 15 biodiversity hotspots, the 'Border Ranges North and South (Queensland and New South Wales)'. Biodiversity hotspots are areas that support natural ecosystems that are largely intact and where native species and communities associated with these ecosystems are well represented. Areas with many endemic species where the levels of stress or future threat were considered to be high were identified by the Australian Government's Threatened Species Scientific Committee as hotspots. In relation to the Border Ranges North and South the Environment Australia website notes;

> *This sub-tropical and temperate hotspot is one of Australia's most diverse areas - and it is* the *most biologically diverse area in New South Wales and southern Queensland. It has a variety of significant habitats: subtropical rainforest, wet sclerophyll forest, mountain headlands, rocky outcrops and transition zones between forests.*
>
> *These habitats support a huge variety of bird and macropod species. Many are rare or threatened: the Richmond Bird-wing Butterfly, Fleay's Frog, Hastings River Mouse, Long-nosed Potoroo, Spotted-tailed Quoll, Eastern Bristle Bird, Rufous Scrub-bird and the critically endangered Coxen's Fig parrot. Notable birds such as Albert's Lyrebird and the Paradise Riflebird make their home here, and in the south-east Queensland rainforests live a rich variety of primitive plant species, many of them similar to fossils from Gondwana.*
>
> *This region's high population growth, with associated urban and tourist developments along the coast, is a major cause of habitat loss and fragmentation. Although most remaining natural areas are protected, they are under considerable threat from weeds, fire and recreational use.*

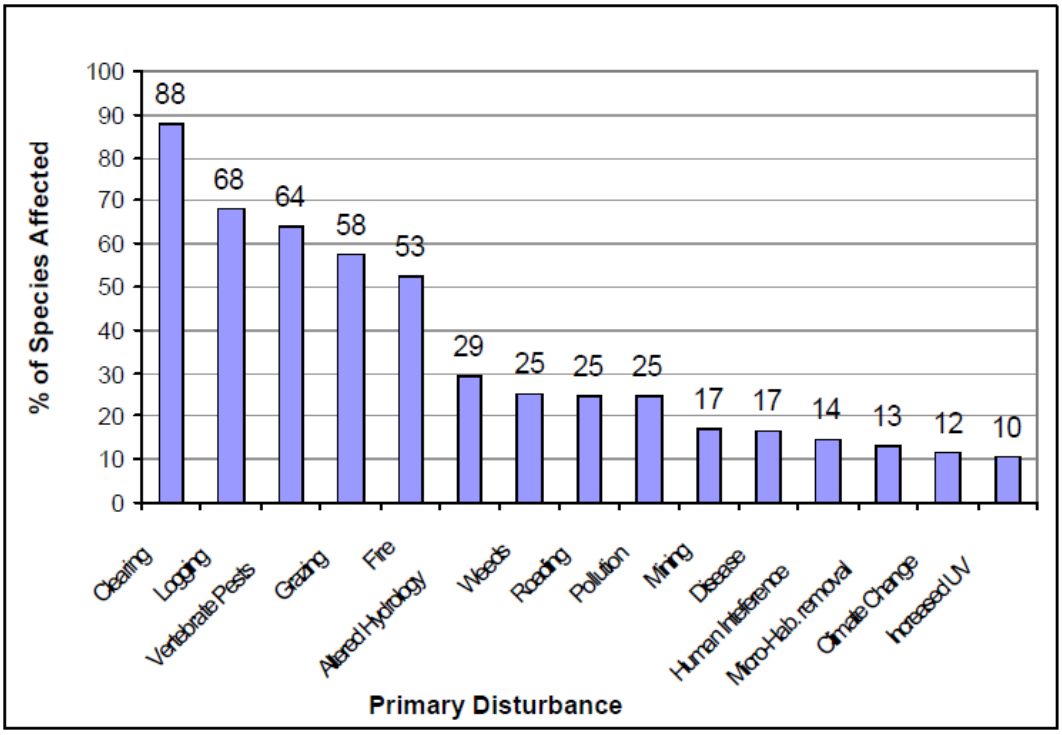
Clearing, logging, grazing, feral animals, weeds, too frequent burning, and drying landscapes due to increased transpiration of regrowth have been identified as the primary threats to north-east NSW's threatened forest fauna. These impacts are now being compounded by the impacts of global warming.

During expert workshops conducted as part of the CRA process for North East NSW information describing the disturbances that affect the priority species was collected (Environment Australia 1999). This involved experts listing all the disturbances affecting a species and then ranking them in terms of their impact on the regional population. Those disturbances that had the most detrimental affect were ranked one and so on. Many species have multiple threats.

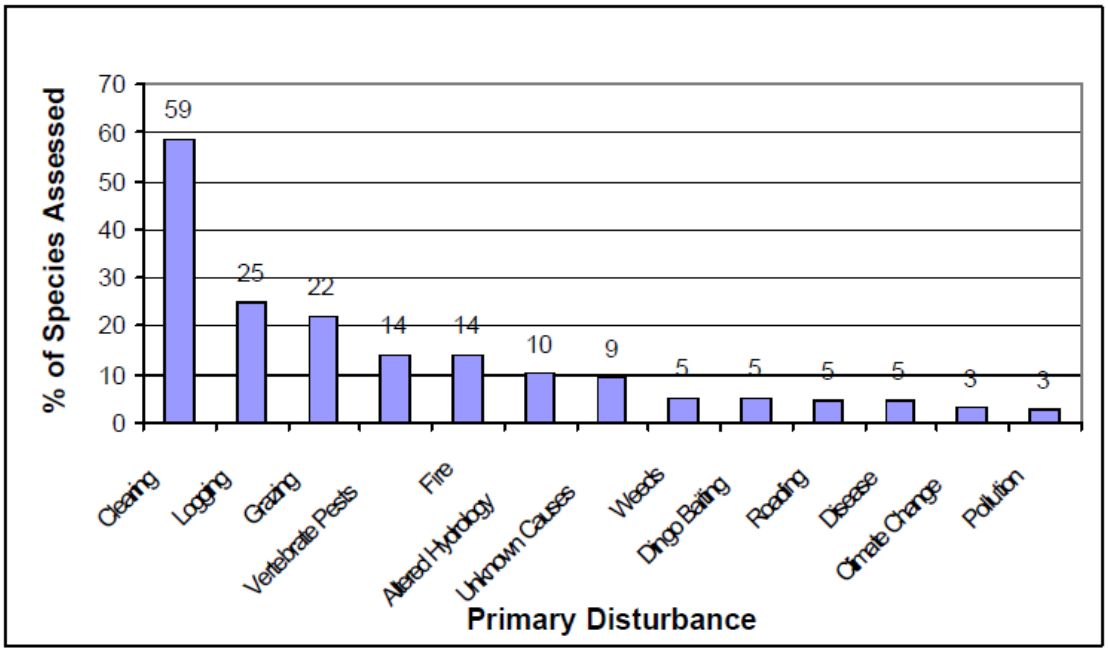
For priority fauna species in north-east NSW the expert panels assessed threats to priority fauna species (Environment Australia 1999), finding:

- clearing is a serious threat to 88% of species, and a primary threat to 59% of species;
- logging is a serious threat to 68% of species, and a primary threat to 25% of species;
- grazing is a serious threat to 58% of species, and a primary threat to 22% of species;

- vertebrate pests are a serious threat to 64% of species, and a primary threat to 14% of species;
- fire is a serious threat to 53% of species, and a primary threat to 14% of species;
- altered hydrology is as a serious threat to 29% of species and a primary threat to 10% of species; and,
- weeds are a serious threat to 25% of species, and a primary threat to 5% of species



The percentage of all fauna species assessed that have the listed disturbances nominated as having an adverse impact. From Environment Australia (1999).



The percentage of all fauna species assessed that have the listed disturbance ranked number one. From Environment Australia (1999).

The flora expert panel unanimously agreed the main threats to plant biodiversity in north-eastern New South Wales were land clearing, inappropriate fire regime, weeds (and forest hygiene in general) and grazing (Environment Australia 1999).

Of those species identified as being of particular conservation concern (Environment Australia 1999), a total of 7 mammals (excluding bats), 27 bats, 31 birds, 16 frogs, 5 turtles, 15 lizards and 8 snakes were identified as being specifically vulnerable to logging, with many of these species, and a number of others, also vulnerable to the associated fire regimes, hydrological changes, stream pollution and weed invasions. For 41 of these 109 species logging is identified as a primary (number 1) threat.

While the primary threats to north east NSWs species and ecosystems are clearly recognised their management to limit impacts on threatened species has been very poor.

As implemented in NSW both the recovery planning and critical habitat processes have been bungling farces due to government hostility and incompetence. For the vast majority of species they have failed to achieve their intent.

The Threatened Species Conservation Act 1995 (TSCAct) required Recovery Plans for all endangered species to be prepared within 5 years (by January 2001) and for all vulnerable species within 10 years. For species listed since January 1996 the timelines are only 3 years for endangered species.

The Office of Environment's abject failure (in its many incarnations) to engage responsibly in the recovery plan processes is highlighted in the sub-section on the Hastings River Mouse. By June 1999, after some three and a half years of operation of the TSCAct (and many more years since the need to prepare recovery plans was identified), only two Recovery Plans had been adopted.in NSW. At that time, within the region covered by the Northern zone of the then NPWS, out of a total of some 225 species (97 endangered) requiring the preparation of recovery plans only one had been adopted, with Recovery Plans for a further 5 species at the exhibition stage.

This slow progress with the Recovery Plan process was due to NPWS's lack of commitment to the concept. By 2004 the situation with preparation of recovery plans had become such a farce that the NSW government amended the TSC Act to remove the mandatory requirement to prepare individual recovery plans and threat abatement plans, replacing it with "a more strategic, landscape-based approach that integrates species recovery with threat abatement". Preparation of recovery plans became optional.

Over 850 species are now listed as threatened in NSW, with an additional 74 listed as 'presumed extinct'. A number of populations and ecological communities are also listed. There are now 84 recovery plans for Endangered species and 16 for vulnerable species, representing some 12% of threatened species. A variety of recovery plans dating back to 2004 are still "pending finalisation".

Aside from the NSW Government's reluctance to prepare recovery plans, there are major flaws with the concept due to the Government's unwillingness to impose needed restrictions for threatened species recovery upon itself or private landowners (i.e. see the sub-section on Koalas) and a refusal to identify actions that it considers too costly. Recovery Plans have increasingly become political statements that fail to identify essential management actions. Even when recovery plans do identify specific management actions they are often not implemented, even by Government agencies (i.e.

see the sub-section on Hastings River Mouse). With a few exceptions, recovery planning has failed to provide the protection needed for the recovery of threatened species.

Despite "Critical Habitat" being one of the corner-stones of the TSC Act with the potential to provide meaningful protection to core areas of habitat. Over the years OEH have clearly shown open antagonism towards identifying critical habitat for endangered species. Even when critical habitat is clearly definable and recommended by experts and OEH staff, it has been rejected out of hand by Head Office.

It took until 2001 for OEH to first declare critical habitat for Mitchell's Rainforest Snail, and even then they limited the declaration to within a nature reserve. This was followed by the Little Penguin in 2002, Gould's Petrel in 2006 and Wollemi Pine in 2007. There are three critical habitat recommendations dating from 2002, 2005 and 2006 that are "pending finalisation". This clearly displays contempt for critical habitat by the OEH.

With friends like the OEH and EPA, endangered species don't need enemies.

The most effective way to maximise control of the primary threatening processes for threatened species of clearing, logging, grazing, too frequent burning, and drying landscapes due to increased transpiration of regrowth, is by their protection in conservation reserves. Unfortunately the reserve system in north-east NSW is grossly deficient in terms of satisfying the minimal national reserve criteria and leaves most threatened species inadequately reserved, with many being virtually excluded from the reserve system, even when they occur on public land. This is dealt with in Section 2.

Adequate measures need to be applied off-reserve to maintain ecosystem health and functional populations of native species throughout their natural ranges. Such prescriptions need to have specified performance criteria, be independently audited regularly to assess their performance and be improved as necessary. Unfortunately off-reserve management for threatened species is politically determined, woefully inadequate, not subject to review of effectiveness and consequent improvements, and poorly enforced. This is dealt with in Section 3.

The resources allocated to the control of feral animals are inadequate, though on parks are subjected to a prioritisation process for targeting resources. Unfortunately NSW cutbacks in NPWS staff and the introduction of recreational hunting into national parks threaten to derail any systematic approach to feral animal control. This is dealt with in Section 4.

The canopy openings and disturbances due to logging are facilitating the increasing dominance of exotic weeds in native forests. In north-east NSW the nationally significant weed lantana now infests hundreds of thousands of hectares of forest, and it gets worse with every logging operation. At its worst, it is promoting Bell Miner Associated Dieback which is killing tens of thousands of hectares of native forests. Forests NSW are targeting the worst affected areas for maximum disturbance and leaving destroyed ecosystems behind, while EPA, the supposed regulators, turn a blind eye. This is dealt with in Section 5.

The Inquiry needs to recognise that in NSW the preparation of recovery plans and the identification of critical habitat for threatened species have been actively resisted by OEH and Government. The few recovery plans prepared often fail to identify needed management actions and thus often fail to address the principal threats to the species. Relevant actions in recovery plans are often ignored, even

by NSW Government agencies. The recovery planning and critical habitat processes have largely failed due to a lack of commitment to the protection of threatened species.

The Inquiry needs to recognise that in north-east NSW the grossly inadequate reserve system and off-reserve reserve management regime is condoned by the NE Regional Forest Agreement and thus exempted from the *Environment Protection and Biodiversity Conservation Act 1999.* The Commonwealth is culpable for the many environmental offences identified herein and their lack of any meaningful oversight is an abrogation of their national and international obligations.

2. ESTABLISHING AN ADEQUATE RESERVE SYSTEM

The NFPS (CoA 1992) established that *"It is important that Australia has a comprehensive, adequate and representative network of dedicated and secure nature conservation reserves for forests and reserves for protecting wilderness."*, with the governments agreeing *"that the system of reserves should be reviewed and its development completed as a matter of priority."*

The NFPS (CoA 1992) states that for conservation:

> *The goals are to maintain an extensive and permanent native forest estate in Australia and to manage that estate in an ecologically sustainable manner so as to conserve the full suite of values that forests can provide for current and future generations. These values include biological diversity, and heritage, Aboriginal and other cultural values.*

In signing the NFPS the states, including the NSW Greiner Government, committed themselves to establishing a comprehensive, adequate and representative (CAR) reservation system to protect old-growth forest, wilderness and biodiversity values by the end of 1995 for public lands, with the inclusion of necessary forest from private land by 1998.

The principal biodiversity conservation outcome of the NFPS was the establishment of the principles of 'comprehensive', 'adequate' and 'representative' as the basis for developing reserve criteria from which to review and establish reserve systems to protect the conservation values of forests. These three key words are defined in the NFPS as:

> ***comprehensiveness*** *- includes the full range of forest communities recognised by an agreed national scientific classification at appropriate hierarchical levels;*
> ***adequacy*** *- the maintenance of ecological viability and integrity of populations, species and communities;*
> ***representativeness*** *- those sampled areas of the forest that are selected for inclusion in reserves should reasonably reflect the biotic diversity of the communities.*

In 1995 the NSW Government signed the National Strategy for the Conservation of Australia's Biological Diversity, which again committed the Government to the establishment of a comprehensive, adequate and representative network of terrestrial and marine protected areas by 2005.

In accordance with the National Forest Policy Statement a working group of Commonwealth and State bureaucrats, called the Joint ANZECC / MCFFA National Forest Policy Statement Implementation Sub-committee (known as JANIS), was established in 1993 to identify national reserve criteria.

In desperation after the 1994 woodchipping debacle the Commonwealth developed their own *"National Forest Conservation Reserves, Commonwealth Proposed Criteria"* (CoA 1995). The Commonwealth criteria were developed by a Scientific Advisory Group based upon the JANIS deliberations to that time, and also involved reference to the Commonwealth's Forest Policy Advisory Forum (including representatives from conservation groups, the unions and the timber industry) and public submissions. The Commonwealth's criteria were a compromise between conflicting interests and were evidently based upon maintaining the apparition of being world leading while minimising the impact of establishing a reserve system on a national scale.

The Commonwealth criteria (CoA 1995) for the first time established quantitative targets for forest ecosystems, oldgrowth and wilderness. Perhaps the most significant, and certainly the most

controversial, of these for NSW was the requirement to reserve at least 15% of the pre-1750 distribution of each forest ecosystem.

With the election of the Federal Howard Government the criteria were further compromised and weakened, finally resulting in *Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia* (JANIS 1997). Finally four years after the working group was established, and two years after the reserve system was due to be completed for public lands, the JANIS reserve criteria were agreed to by the Commonwealth and State Governments (though not the conservation movement).

JANIS (1997) establishes the objectives of biodiversity conservation for forests are:

- *to maintain ecological processes and the dynamics of forest ecosystems in their landscape context;*
- *to maintain viable examples of forest ecosystems throughout their natural ranges;*
- *to maintain viable populations of native forest species throughout their natural ranges; and*
- *to maintain the genetic diversity of native forest species.*

For forest ecosystems and species JANIS (1997) establishes that:

(1) As a general criterion, 15% of the pre-1750 distribution of each forest ecosystem should be protected in the CAR reserve system with flexibility considerations applied according to regional circumstances, and recognising that as far as possible and practicable, the proportion of Dedicated Reserves should be maximised (see Section 4).

(2) Where forest ecosystems are recognised as vulnerable, then at least 60% of their remaining extent should be reserved. A vulnerable forest ecosystem is one which is:

i) approaching a reduction in areal extent of 70% within a bioregional context and which remains subject to threatening processes; or

ii) not depleted but subject to continuing and significant threatening processes which may reduce its extent.

(3) All remaining occurrences of rare and endangered forest ecosystems should be reserved or protected by other means as far as is practicable.

(4) Reserved areas should be replicated across the geographic range of the forest ecosystem to decrease the likelihood that chance events such as wildfire or disease will cause the forest ecosystem to decline.

(5) The reserve system should seek to maximise the area of high quality habitat for all known elements of biodiversity wherever practicable, but with particular reference to:

* *the special needs of rare, vulnerable or endangered species;*
* *special groups of organisms, for example species with complex habitat requirements, or migratory or mobile species;*
* *areas of high species diversity, natural refugia for flora and fauna, and centres of endemism; and*
* *those species whose distributions and habitat requirements are not well correlated with any particular forest ecosystem.*

(6) Reserves should be large enough to sustain the viability, quality and integrity of populations.

(7) To ensure representativeness, the reserve system should, as far as possible, sample the full range of biological variation within each forest ecosystem, by sampling the range of environmental variation typical of its geographic range and sampling its range of successional stages.

(8) In fragmented landscapes, remnants that contribute to sampling the full range of biodiversity are vital parts of a forest reserve system. The areas should be identified and protected as part of the development of integrated regional conservation strategies.

Section 4 of JANIS (1997) notes the aim of applying the reserve criteria is to include sufficient forests to meet the criteria in Dedicated Reserves equivalent to Categories I, II, III or IV as defined by the IUCN Commission for National Parks and Protected Areas.

To satisfy the JANIS requirement to incorporate viable populations of priority fauna into the reserve system, reserve targets for fauna in the north-east NSW CRAs were identified by application of a formula which used life history parameters known to influence a species probability of extinction to give an estimate of the relative amount of area different species may need to persist. This was described as the minimum viable area needed to maintain a species in perpetuity and the output was termed a habitat protection target. Expert panels then identified subregions for populations separated by dispersal barriers. Targets were applied using modelled mapped habitat reviewed by expert panels.

For flora, targets were primarily based on reserving numbers of localities, as determined by an expert flora panel, rather than percentages of localities. This is still a long way from the goal of protecting viable populations.

In early September 1998 the Government agencies (State Forests, National Parks and Wildlife Service and Department of Urban Affairs and Planning) applied the environmental data and the national reserve criteria to identify 'information points' that were presented to the full stakeholder process. The information points were designed to illustrate the range of potential reserve and timber outcomes from the process.

The information point "Maximised JANIS" was intended "*to provide an indication of the likely maximum practicable achievement of targets in dedicated reserves within the region*". However, even this benchmark was not allowed to be implemented unhindered and, regardless of significant shortfalls in target achievement, agencies were directed not to exceed an arbitrary 70% of the State Forest estate in either region. Even with this limitation 1,027,655 hectares of public forests in north-east NSW were identified as requiring reservation in order to reasonably satisfy the national reserve criteria.

The State Government agencies were subsequently instructed to develop a reserve system that would allow the supply of 270,000 cubic metres of sawlogs per annum for 20 years only, with reductions in supply volume allowable thereafter. There was very little 'timber' left above and beyond this volume for building reserves, which meant that the overall size of the reserve outcome was severely constrained from the outset.

On the 12 November 1998, Premier Carr announced the creation of 386,627 hectares of new NPWS reserves, 3,820 hectares of new SFNSW Flora Reserves and 20,100 hectares of new Crown reserves in north-east NSW (Anon. 1999c and Anon. 1999d). The decision was implemented by the *Forestry and National Parks Estate Act 1998.*

The decision also promised to protect a subset of oldgrowth forests designated as 'high conservation value', all mapped rainforest, wilderness and steep and non-commercial areas in a

management zoning system on State Forest tenure (Anon 1999c and Anon 1999d). After on-going agitation by conservationists over the following year, this promise was finally implemented with the inclusion of 370,000 hectares in protected Forest Management Zones in late 1999. Forest Management Zones can be amended or revoked by the Minister for Forests at any time. The most common 'protected' zones do not allow logging, but do allow on-going roading, mining, burning and grazing (Anon 1999c) and are not actively managed for conservation.

It is evident that the reserve system in north-east NSW does not satisfy the minimal national criteria for the basic requirement for inclusion of 15% of the pre-European extent of each ecosystem, nor does it incorporate the minimal populations of most threatened plants and animals identified as requiring full protection. The inadequate reserve system is supplemented by patches of forest with special values, particularly wilderness, oldgrowth and rainforest, excluded from logging across the public forest estate, mostly in Special Management Zones. Even with inclusion of these informal reserves the national criteria are far from satisfied. North east NSW's forests are one of Australia's and the world's biodiversity hotspots and yet have the worst reserve system in Australia.

There is an urgent need to expand north east NSW's reserve system to achieve the basic requirements of a comprehensive, adequate and representative reserve system.

The outcome of the process was that most reserve targets were not satisfied. Ecosystems were taken to be the primary surrogate for biodiversity, and reserve targets for ecosystems were established on the basis of reserving a minimum proportion of each ecosystem so as to reasonably sample the variation in biodiversity across their range, The NSW Government limited its Summary of Achieved Targets (Anon. 1999c, Attachment 2) to forest ecosystem and oldgrowth targets, stating:

> *In the Upper North East Region there are 162 forest ecosystems and 144 old growth ecosystems. If the additions to the formal reserve system are adopted, as outlined in this Cabinet Minute, a total of 59 forest ecosystems and 26 old growth ecosystems will achieve conservation targets. This will leave 103 forest ecosystems below target, of which 74 are ranked highly vulnerable, and 118 old growth forest ecosystems below target, of which 76 are ranked highly vulnerable (see attachment G).*
>
> *In the Lower North East Region, there are 198 forest ecosystems and 169 old growth ecosystems. If the additions to the formal reserve system are adopted, a total of 83 forest ecosystems and 59 old growth ecosystems will achieve conservation targets. This will leave 115 forest ecosystems below target, of which 87 are ranked highly vulnerable, and 110 old growth ecosystems below target, of which 56 are ranked highly vulnerable (see attachment H).*

Since the 1998 decision there have been a number of areas added to reserves as part of the resolution of outstanding areas and as a consequence of the 2003 Icon Decision. This process has resulted in most larger areas of mapped oldgrowth forest and wilderness on public land being protected and significant improvements in forest ecosystem, fauna and flora target achievement. Despite this there are still significant shortfalls in many reservation targets.

Off-reserve protection in Forest Management Zones (FMZ 1,2,3A) and Special Management Zones, as well as protection by prescription, make significant contributions towards attainment of the JANIS reserve targets. While we have updated the attainment of targets within reserves we have not been able to do so for off-reserve protection at this time. For illustrative purposes we have indicated the magnitude of the likely contribution such categories make to attainment of forest ecosystem targets

based on the RFA's (Anon 2000) claims. Though it needs to be stressed that this is only indicative as many of the areas contributing in 2000 have since been added to the reserve system. It has also been found that logging incursions into areas meant to be informal reserves are common, that FMZ3B is not managed for its special values, and prescriptions are often not applied.

An assessment of overall achievement of reserve targets for the upper and lower north-east shows that there is still a shortfall of over 670,000 ha (36%) in the attainment of the JANIS reserve targets for ecosystems within the formal reserve system. 282,000 ha of these unmet targets could be satisfied from public lands if the Government wanted to, though the balance would need to be sourced from private lands. If allowance is made for informal reserves on state forests and logging prescriptions then the shortfall in ecosystem protection is still over 410,000 ha, of which some 115,000 ha could be protected on public lands.

		Upper North East	Lower North East
Number of Ecosystems		162	198
Total target area		759,801ha	1,079,667ha
Total target area attainable from public land.		567,622ha	883,018ha
Reserves as at 2004	Number of Ecosystems under target	95	107
	Remaining Shortfall in targets	322,675ha	348,472ha
	Remaining shortfall available from public lands	130,097ha	151,823ha
Reserves as at 2004, plus informal reserves and prescriptions+	Number of Ecosystems under target	80	92
	Remaining Shortfall in targets	199,551ha	214,044ha
	Remaining shortfall available from public lands	59,778ha	54,876ha

+ Note that the areas counted as being protected in informal reserves or by prescription are those given in the 2000 RFA, and as many of these areas were subsequently incorporated into reserves they have been in effect double counted – these figures thus overstate the ecosystem reservation status.

		UNE Ecosystem Target Achievement (no)				
		<25%	**25-49%**	**50-74%**	**75-99%**	**>100%**
2000	**Dedicated Reserves**	52	23	17	18	52
	Dedicated and Informal Reserves and Prescriptions	34	24	11	20	73
2004	**Dedicated Reserves**	38	22	16	19	67

		LNE Ecosystem Target Achievement (no)				
		<25%	**25-49%**	**50-74%**	**75-99%**	**>100%**
2000	**Dedicated Reserves**	48	29	20	23	78
	Dedicated and Informal Reserves and Prescriptions	36	21	21	27	93
2004	**Dedicated Reserves**	36	23	23	25	91

The reserve additions since 2000 have significantly improved the reservation status of forest ecosystems, though across both UNE and LNE 202 ecosystems (56%) remain below target, with

119 (33%) not even achieving 50% of their targets. Even with allowance for off-reserve protection it is likely that some 172 ecosystems (48%) remain below target.

For NSW separate targets were set for the inclusion of viable populations of the most vulnerable vertebrate fauna and vascular flora in reserves. In the whole of north east NSW only 31% of the CRA reserve targets for viable populations of fauna species have been achieved to date. The combination of extensive clearing, inadequate reservation and high biodiversity puts even greater emphasis on the need to appropriately constrain threats.

Flint, Pugh and Beaver (2004) analysed the adequacy of the reserve system for fauna as at 2004. They found that there is still grossly inadequate reservation for most species;

> *A binary target assessment of all 710 fauna populations under consideration (excluding targets for bat roosts) reveals that only 217 (31% of all populations) have met conservation targets. Seventy-two of the 139 species (or 52% of species) with targets set have failed to meet target for any of their populations. Only 17 species have met target for all their populations, while the remaining 50 species have met target for at least one but not all populations.*
>
> *A proportional target analysis indicates that only 45% of fauna populations have sufficient habitat reserved to achieve 50% or more target fulfilment, and 20% of fauna populations are yet to achieve even 10% of the habitat required to meet targets. The mean target achievement for all populations across all tenures is 49%, and the target area index is 33%. The mean target achievement for public lands is 76% and the target area index is 70%.*
> *...*
> *Of the 38 fauna species ranked by the expert panel as having the highest vulnerability to threatening processes (vulnerability 1), 30 do not attain targets for any populations, and none attain targets for all populations. Only 8 species attain targets for one or more populations. Therefore, species with the highest vulnerability to threatening processes remain very poorly reserved.*

Examples of the achievement of reservation targets for particular species (Flint, Pugh and Beaver 2004) in north-east NSW (UNE and LNE) were:

- **Hastings River Mouse**, a nationally Endangered species; target was 33,969 breeding females distributed across 8 populations (of up to 4,251 females each). The outcome was the reservation of a total of 2,863 breeding females, with 8% of the mean target achieved (1-29%).
- **Spotted-tailed Quoll**, a nationally Vulnerable species; target was 4536 breeding females distributed across 4 populations (of up to 1,800 females each). The outcome was the reservation of a total of 1,201 breeding females, with 25% of the mean target achieved (10-55%)

The outcomes for flora are no better. There were a total of 543 targets set for priority flora species in both the Upper and Lower North East CRAs. Only 22% of targets have been achieved in the formal reserve system to date, leaving 78% of priority species not adequately represented in reserves. With 57% of species achieving less than half their targets and 106 species (20%) achieving none of their targets.

Priority Flora Target Achievement in Formal Reserves as at 2004

	NE Flora Species Target Achievement (no)				
	<25%	**25-49%**	**50-74%**	**75-99%**	**>100%**
UNE	161	56	45	13	64
LNE	58	37	40	11	58
TOTAL	219	93	85	24	122

These outcomes highlight the failure of the RFA process in north east NSW to satisfy national reserve criteria and deliver on the promise of an adequate reserve system sufficient to maintain the ecological viability and integrity of fauna populations. The extremely poor reservation status of many threatened fauna and flora species in north-east NSW emphasises the need for substantial additions to the reserve system to improve fauna and flora conservation, as well as the strict application of strengthened logging protocols that take into account the poor reservation outcomes. Evidence from NEFA's audits is that off-reserve management prescriptions for fauna and flora are frequently not being applied, are inadequately implemented or are negated by other forestry practices.

The Inquiry needs to recognise that the reserve system in north-east NSW does not satisfy the national reserve targets. Even when informal reserves and values protected by prescription are counted the reserve system remains grossly deficient. Only 64% of the total area of ecosystems needed to satisfy the ecosystem targets has been reserved and 33% of ecosystems have not met even half their targeted areas. It is most worrying that 52% of fauna species fail to meet the targets set for any of their populations and that only 31% of populations have achieved targets aimed at encompassing viable populations of our most vulnerable species into the reserve system. Flora also fare poorly with 78% of plants not satisfying their targets, and 20% not achieving any of their targets.

The inquiry should specifically review the reserve status of federally listed species and ecosystems in north-east NSW in light of identified threats.

The inquiry should promote the need to significantly expand the reserve system in north east NSW to provide the needed protection for biodiversity and nationally threatened species, so as to bring it up to national standards.

2.1. UNSUSTAINABLE LOGGING THREATENS RESERVE SYSTEM

North-east NSW's public forests have been intentionally logged on an unsustainable in accordance with the 2000 North East Regional Forest Agreement. Now that the industry has almost used up the high-quality sawlog resource in their allocation of public lands, they are seeking over a million hectares of north-east NSWs forests to be revoked for logging and for a major wind back in logging protections for threatened species. The NSW Government seems to be seriously considering these proposals.

For the CRA Forests NSW relied upon their Forest Resource and Management System (FRAMES)

to estimate timber resources. After the creation of the new (1998) national parks, exclusion of areas for further consideration, and with the protection of the Government's HCV oldgrowth forest, rainforest, streams and allowance for threatened species protocols, FRAMES identified the 100 year sustainable yields of *High Quality Large Sawlogs* as 80,319 m^3 gross of high quality large sawlogs per annum for the Upper North East CRA region (UNE) and 136,902 m^3 per annum in the Lower North East (LNE). Thus 217,221 m^3 per annum was identified as the sustainable yield of large quota sawlogs at that time.

As an outcome of the CRA, and based upon the FRAMES estimates, the NSW Cabinet determined in November 1998 that supplies to industry from public forests would be 109,000 m^3 of High Quality Large sawlogs (quota sawlogs) and 2,000 m^3 High Quality Small sawlogs per annum from the Upper North East, and 160,000 m^3 of high quality large sawlogs (quota sawlogs) and 8,500 m^3 High Quality Small sawlogs per annum from the Lower North East. The intent was thus to log at the unsustainable rate of 269,000 m^3 per annum until 2018, before reducing down to a sustainable yield of 183,500 m^3 per annum thereafter. The NSW Government thereby intended to deliberately commit NSW to unsustainable logging.

In clear recognition of the failure to apply sustainable yield in north-east NSW, the Regional Forest Agreements (Anon 2000) claimed to be implementing a strategy for sustainability:

> ***"Sustainable Wood Supply Strategy"*** *means the intent to manage yields of High Quality Large Sawlogs and Large Veneer Logs from the forest at a specific and constant level for twenty years under a given management strategy and suite of sustainable use objectives. It recognises that a transition to long term Sustainable Yield will be phased in to accommodate social and economic considerations;*

The strategy was to go on logging at unsustainable rates, and to supplement this by purchasing private properties with existing resources and for establishment of new plantations to attempt to increase future timber availability.

The Regional Forest Agreement for North East New South Wales (Upper North East and Lower North East Regions) (Anon2000) states:

> *Under the Sustainable Wood Supply Strategy, NSW agrees to supply 129,000m^3 per annum for 20 years in the Upper North East Region and 140,000 m^3 per annum in the Lower North East Region of High Quality Large Sawlogs and Large Veneer Logs. Annually, approximately 20,000 $m^3$of High Quality Large Sawlogs and Large Veneer Logs allocated in the Upper North East Region will be sourced from the Lower North East Region over the period of the Agreement.*
>
> *...*
>
> *... It is estimated that the 100 year supply levels after 2018 will average approximately 70,000 m^3 per annum in the Upper North East Region and 113,500 m^3 per annum in the Lower North East Region of High Quality Large Sawlogs and Large Veneer Logs from existing native forests and Plantations on State forests and other land owned by SFNSW, assuming harvesting under existing terms and conditions.*
>
> *...*
>
> *Both Governments aim to provide additional sawlog and other wood products that will become available through purchase by SFNSW of private native forest property and through Plantations established on purchased land or as joint ventures. These measures are currently predicted to bring the average annual available High Quality Large Sawlog and Large Veneer Log yield from State forests beyond the 20 years of this Agreement to within*

approximately 15 per cent of the 20 year contracted levels for Upper North East Region and Lower North East Region.

In 2002 Jerry Vanclay (Southern Cross University) undertook a desktop review "Review of Projected Timber Yields for the NSW North Coast" of FRAMES "*based on an examination of documentation and on interviews with State Forests staff and other stakeholders involved in preparing the estimates ... no field visits were made and no new field data were obtained*". Vanclay (2002) presented results from Forestry NSW's 2002 North Coast Timber Supply Monitoring Estimate which he endorsed, stating that for both the UNE and LNE *"With these assumptions, it is evident that the harvest able to be sustained during the next 20 years is 220,000 m3/year at most ... In the longer term (21-100 years), production from native forests is expected to range between 175 and 110,000 m3/year, and will need to be supplemented from hardwood plantations.".* He recommended monitoring of a large range of key variables to improve the best current estimate.

2002 North Coast Timber Supply Monitoring Estimates of large high quality sawlogs compared to FRAMES 1998 (From Vanclay 2002)

Item & Source	RFA-FRAMES	NCTS Monitoring
Short-term yield (20 yrs)	269,000 m3/yr	220,000 m3/yr
Medium-term yield (21-40 yrs)	183,500 m3/yr	175,000 m3/yr
Average Long-term yield (41-100 yrs)	183,500 m3/yr	110,000 m3/yr

In January 2003 Forests NSW forgave some $1million of debt owed by Ford Timbers in return for 15,000 m^3/year of quota, though claimed they intended to re-sell it.

Due to an ongoing campaign by conservationists, in the lead-up to the NSW State elections in March 2003, the ALP announced that it would protect a further 65,000 hectares of public forests (MR 'Premier Carr Announces Protection for Forest Icons', 2 March 2003). This included 45,000 hectares contained in 15 "icon" areas that were transferred to formal reserves and 20,000 hectares of oldgrowth forest that was transferred to Special Management Zones protected from logging (*National Parks Estate Reservation Act 2003*). The icons included many of the highest conservation value forests in the region, including a sequence of large coastal forest reserves and some important oldgrowth stands. The protection of the 20,000 hectares of oldgrowth meant that all large areas of mapped oldgrowth on State Forest tenure in north-east NSW were finally protected.

Despite the reduction in the area of state forest the "net harvest area", which is the basis of yield estimates, was actually increased by some 700ha according to Forests NSW's FRAMES modelling, primarily because of the decision to remove "buffers on buffers". This was achieved by amending the IFOA to allow the accidental felling of trees into most exclusion areas and the entry of machinery into some exclusion areas to fell trees. This significantly increased the proportion of the gross area that could be harvested, theoretically compensating for the new reserves.

Timber availability at that time had also been increased by new plantations and additions to State Forests' estate from private property purchases, while commitments had been reduced by the buy-back of quota from Ford Timbers. So if resource estimates were accurate there should have been no resource problems caused by the new reserves.

Based on Vanclay's assessment, in 2003/4 the NSW Government issued new Wood Supply Agreements to north coast sawmillers for quota, small and low quality sawlogs and extended them for 5 years (until 2003) past the expiry of the NSW Forest Agreements. Most significantly the NSW

Government removed the clause that allowed for a non-compensable reduction in commitment following a review of available timber resources.

Forests NSW's (2005) ESFM Plan provides the details of Wood Supply Agreements for north east NSW.

Table. 2004 Wood Supply Agreement Strategy. From Forests NSW ESFM Plan (2005)

Product	WSA Volume	WSA Type
High-quality large Products	215,422	A
	7,655	B
High-quality small Products	57,759	A
	31,100	B
Low Quality Sawlogs	14,897	A&B
	190,000	C
Total Volume	516,833	

Forests NSW (2005) explain:

The Type A agreements are for a fixed volume for a twenty-year period.

The Type B agreements provide 75% of the volume fixed for the first 10 years, with future volumes subject to resource assessment review in years 10 and 15 of the agreement. The remaining 25% is a share of production capped at 25% of the total agreement, also subject to review in years 10 and 15.

The Type C agreements are based on a share of production and if there is insufficient production in any year, the available volume will be distributed equitably amongst customers as a share of the total production in that year. The figure under WSA for Type C is a target volume rather than a fixed commitment.

For quota sawlogs this set a volume of 215,422m^3 per annum for 20 years, five years past the end of the LNE and UNE Forest Agreements, and resulted in firm commitments for a total supply of 4,365,852m^3, and tentative commitments for a further 95,687m^3. At the time the new WSA were made there were remaining commitments of 254,000m^3 of large quota sawlogs for 15 years, which is a total of 3,810,000m^3. These new WSAs thus resulted in an increase in committed volumes of large quota sawlogs of 555,852 to 651,539m^3 - not a bad windfall for millers, particularly as Ford Timbers' quota of 15,000m^3 pa had been bought back for some $1million and yield reviews were showing that commitments needed to be substantially reduced.

As if Forests NSW and the timber industry had not already been given enough, the area available for logging was again significantly increased in 2004 by amendments to the Environment Protection Licence that effectively allowed logging within the buffers of most unmapped streams. This was simply achieved by excluding non-scheduled forestry activities from the requirements of the Environment Protection Licence on 17 May 2004. As a result of this change, over 90% of logging operations no longer required Environmental Protection Licences. By removing the requirements for 10m buffers on unmapped streams and the requirement to limit damage to drainage depressions this significantly increased the areas and volumes available for logging. It has also resulted in significantly increased environmental harm and impacts on threatened species.

Forest Management Zone 8 areas are primarily comprised of modelled unmapped streams, with some modelled high erosion areas, that are intended to be further assessed at the Harvesting Plan stage. These represent over 100,000 hectares that were not counted as contributing to timber supply on the basis that they would be refined by field assessments and allocated to exclusion zones (i.e. FMZ 3A). In practice, since unmapped streams are no-longer required to be protected

(except where threatened fish are present downstream), they are not further assessed and now simply counted as being part of the general logging area.

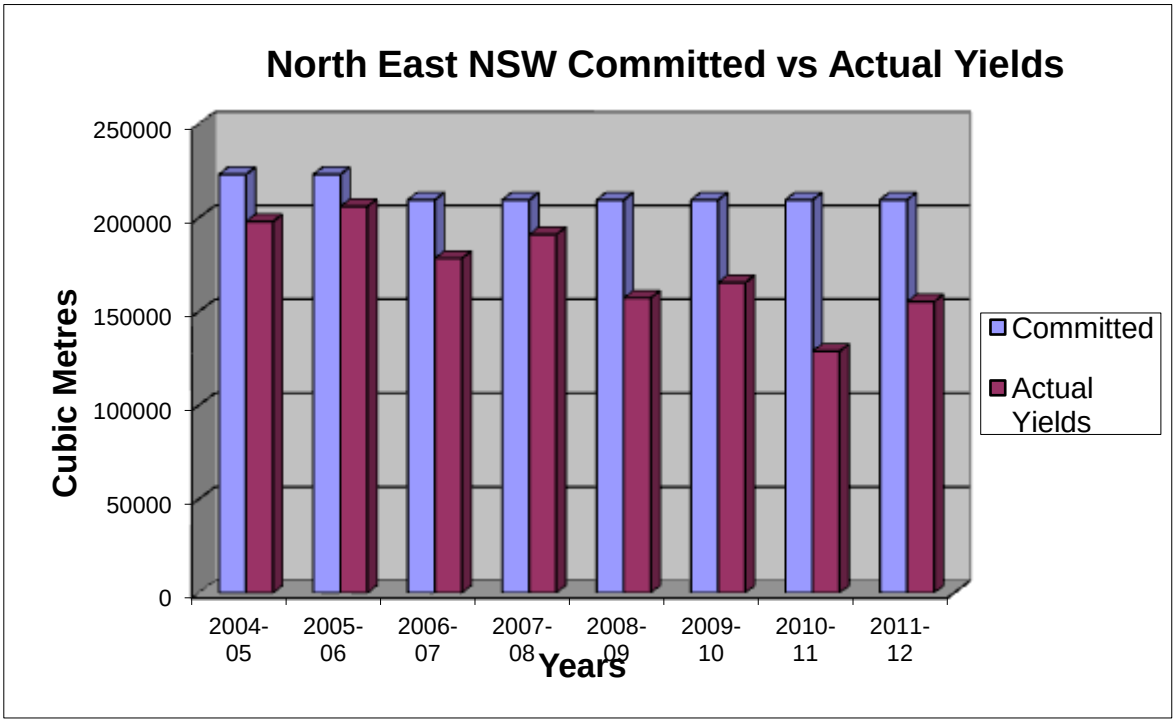
And in another attempt to reduce timber commitments, in 2006 and 2007 $2,777,000 was spent buying back 12,194m^3 of Wood Supply Agreement commitments (substantially more than was paid to Ford Timbers a few years earlier).

Since the RFA was signed by the Commonwealth there has thus been a much needed increase in the reserve system, an entrenching of deliberate unsustainable logging until 2023 and major wind backs in protection of threatened species by allowing the logging of "buffers on buffers" and unmapped drainage lines.

Despite the net increase in the area available for logging the resource situation continues to deteriorate. The problem of unsustainable logging remains. Ever since the 2003/4 WSAs were signed Forests NSW have not been able to meet commitments. Across north east NSW, over the 8 years 2004-12 there was a shortfall between commitments given in WSA and actual yields of large high quality sawlogs of at least 323,064m^3 (19%). To supplement supply Forests NSW has increased logging of small high quality sawlogs (the large sawlogs of the future) and is getting into the plantations too early. This is further reducing long-term sustainability.

Forests NSW have already had to buy back timber committed in WSAs, compensate mills that they couldn't meet supply commitments to, and are logging private property. Forests NSW have already had to pay half a million dollars compensation to Boral and are currently being prosecuted for a further 3 years of failure to supply commitments. This is also part of the reason why Forests NSW are increasingly logging trees and areas meant to be protected. With yields declining and native forest operations now operating at losses of over $14 million per annum the situation is worsening rapidly.

NORTH EAST COMPARISON OF ACTUAL YIELDS TO COMMITMENTS _ LARGE HIGH QUALITY SAWLOGS. Source DECCW 2010, Auditor General 2009, parliamentary responses, N. Roberts pers. comm.



The relevance of the intentional unsustainable logging and apparently overstated resource assessments to threatened species is that the NSW Government is currently reviewing timber resources in north-east NSW, and is apparently assessing the timber resources in various conservation reserves with a view to opening them up for logging.

The Forest Products Association (Public Land Use Inquiry 14/9/2012, pp51-61) is asking for over a million hectares of north-east NSW's National Parks, Nature Reserves and State Conservation Areas to be revoked so that they can be logged. In their submission they effectively identified 43 national parks and other conservation reserves in north east NSW for initial revocation, stating that they also want whatever other reserves are necessary to maintain current yields in the long term.

The Inquiry needs to recognise that timber commitments given in the North East RFA are unsustainable and are currently being reassessed by the NSW Government. It is likely that the NSW Government may allow logging of National Parks and other conservation reserves, and reduce logging prescriptions for threatened species

The Inquiry needs to ensure that any changes to the reserve outcomes or timber commitments given in the North East Regional Forest Agreement, made between the Commonwealth and NSW in 2000, are subject to review by the Commonwealth to ensure that existing protections for threatened species are maintained or improved.

3. REDUCING IMPACTS OF FORESTRY OPERATIONS ON THREATENED SPECIES

Forestry operations on public lands are governed by the Integrated Forestry Operations Approval (IFOA) for Upper North East Region and the licences it contains. These are referred to as Environmental Protection Licence (EPL), Threatened Species Licence (TSL) and Fisheries Licence (FL). Together with various clauses of the IFOA these constitute the regulatory regime applied to forestry operations on the public's state forest lands in north-east NSW.

It is important for the Inquiry to recognise that the IFOA underpins the North East Regional Forest Agreement made between the Commonwealth and NSW in 2000. It is also important to recognise that the IFOA is currently being reviewed by the NSW Government in a "Cabinet in Confidence" process that excludes conservation stakeholders. Current prescriptions for threatened species are expected to be significantly weakened.

On freehold land forestry operations are governed by Property Vegetation Plans and the Private Native Forestry Code of Practice for Northern NSW.

As an outcome of the interim assessment process the NSW Government agencies developed and formalised systematic Conservation Protocols to regulate logging on State Forest land outside the Interim Deferred Forest Areas (NPWS 1996), although there was one to two years further delay before these protocols were fully implemented (NPWS 1998a). The Protocols included:

- general prescriptions aimed at protection of broad landscape features (*i.e.* oldgrowth forest, rainforest, rare non-commercial forest types, riparian buffers, wetlands, heath, rock outcrops, caves, and minimum numbers of habitat trees);
- species-specific prescriptions aimed at providing some level of protection of potential habitat and habitat features (i.e. nest sites, roost sites) specific to a species;
- site specific prescriptions to be applied should one of a number of the most poorly known species be found; and
- pre-logging and pre-roading survey requirements aimed at locating threatened species in compartments prior to harvesting.

The Protocols were based on a relatively sound framework for ecologically sustainable management but often failed drastically in the specifics of protection measures applied. The Conservation Protocols were essentially developed through negotiations between the regulator (NPWS) and the regulated agency (SFNSW) without any independent scientific review process. While many of the prescriptions had largely been developed in the NPWS licensing system since the introduction of the *Endangered Fauna (Interim Protection) Act 1991*, they had never been subject to any monitoring or evaluation to assess their effectiveness (and still haven't).

As an outcome of the RFA process, the licence conditions were modified and included in the Integrated Forestry Operations Approval (IFOA) which is a statutory document under the *Forestry and National Parks Estate Act 1998* that includes all regulations pertaining to forestry operations (Anon 1999a, b). It is important to recognise that the revised conditions were developed before the outcome of the RFA was known and are thus based on the assumption that flora and fauna targets have been satisfied, with no attempt to account for the parlous reservation of many species.

The outcomes were documented in the NSW Forest Agreements for north-east NSW that were completed in March 1999 (Anon 1999c,d). The NSW Agreements were later used as the basis for

Regional Forest Agreements that were signed by NSW and Commonwealth Governments in March 2000 (Anon. 2000).

Since the IFOA came into force there have been significant reductions in the protection provided to some species due to the allowance of forestry operations in "buffers on buffers". This was achieved by amending the IFOA in 2003 to allow the accidental felling of trees into most exclusion areas and the entry of machinery into some exclusion areas to fell trees. This included exclusion areas established for species such as the nationally endangered Hastings River Mouse and nationally vulnerable species such as the Spotted-tailed Quoll. This significantly increased the proportion of the gross area that could be harvested, thereby significantly increasing impacts on fauna and flora.

The area available for logging was again significantly increased in 2004 by amendments to the Environment Protection Licence that effectively allowed logging within the buffers of most unmapped streams. This was simply achieved by excluding non-scheduled forestry activities from the requirements of the Environment Protection Licence on 17 May 2004. As a result of this change, over 90% of logging operations no longer required Environmental Protection Licences. By removing the requirements for 10m buffers on unmapped streams and the requirement to limit damage to drainage depressions this significantly increased the areas and volumes available for logging. It has also resulted in significantly increased environmental harm and stream pollution.

There has been no strengthening of any of the Licence prescriptions included in the IFOA licences since they were issued 14 years ago. The major reductions in prescriptions have all been based on resource considerations, not ecological.

In relation to biodiversity Forests NSW (2005) ESFM Plan notes:

> *Forests NSW will use adaptive management principles and actions within State forests to complement the management of the CAR reserve system.*
>
> *…*
>
> *During operations, site specific conditions are continually assessed, results recorded, the appropriateness of operational conditions reviewed and plans amended where necessary.*
>
> *Operational auditing monitors compliance with plan conditions and, where non-compliance occurs, assesses environmental harm, details repair works where necessary, the cause of non-compliance, whether sanctions are necessary and how the non-compliance can be avoided in future operations.*

We have come across no evidence of this, quite to the contrary we are concerned that Forests NSW does not learn from their mistakes. We are most concerned that neither EPA nor Forests NSW have bothered to assess the effectiveness of prescriptions over the past 14 years and improve them accordingly. Rather than applying adaptive management as a routine practice we find that Forests NSW use it as an occasional excuse to log somewhere they shouldn't.

It is not believed that any of the flora or fauna prescriptions have been subject to monitoring to assess their effectiveness. Though without having a clear idea of what they are meant to achieve there is nothing to monitor their performance against. Explicit performance criteria should have been the basis for developing prescriptions, though it is still not too late to use them to review the effectiveness of prescriptions.

It is evident that adequately trained people are not undertaking thorough searches for the *threatened and protected species features* required by the TSL at the mark-up stage (also see the

sub-sections on Koalas and flora). In the absence of appropriately trained people searching for plants, they are simply ignored.

Part of the problem is that often the contractors in their machines are driving around choosing what to log. They have effectively replaced the forest foreman in many operations. They have limited chance of finding many of the required fauna features, such as Koala scats, and little chance of finding cryptic threatened plants. They place reliance upon their Geographic Position Systems (GPS) and often measure exclusion areas from mapped features rather than the required natural features (i.e. top of stream banks). GPSs are also of limited accuracy in the forest.

Forests NSW appear to be moving in the direction of increasing mechanization and away from mark-up surveys. The principal problem with this is that it precludes the implementation of a raft of requirements of the TSL aimed at minimizing impacts on threatened flora and fauna.

The Environmental Protection Authority (nee DECCW, nee OEH) are principally responsible for ensuring Forests NSWs compliance with the Threatened Species Licence (TSL). In the initial 3 years after the RFA DECCW undertook a number of audits of forestry operations in the Upper North East CRA region, but over the 7 years 2002/2009 they undertook only 16 audits in response to 20 complaints of breaches of the TSL. It was not until 2007/2008 that 2 Penalty Infringement Notices were issued in response to a serious complaint. The EPA, in all their incarnations, appear unable to find breaches and unwilling to require compliance. They are reluctant regulators.

A few of the numerous issues associated with maintenance of large old trees in perpetuity, and the protection of threatened flora, fauna and fish are explored in the sub-sections below. Only two fauna species have been specifically considered, though these are considered representative of manifest failures to provide meaningful protection to threatened species in north-east NSW.

The Inquiry must recognise that the Integrated Forestry Operations Approvals, and their constituent Threatened Species Licences, which underpin the North East Regional Forest Agreement made between the Commonwealth and NSW in 2000, are currently being reviewed in a secretive process by the NSW Government and are expected to significantly weaken already inadequate protection for nationally threatened species.

NEFA requests that the Commonwealth intervene in the IFOA review to ensure Commonwealth obligations for threatened species are fully discharged in north-east NSW.

NEFA suggests the Inquiry recommends the adoption of performance measures for flora and fauna prescriptions and auditing of their effectiveness in achieving those measures.

It is recommended that the Inquiry commission appropriate experts to review the likely effectiveness of prescriptions applied to reduce impacts of logging operations on nationally threatened species in north-east NSW. The review should identify explicit performance measures and auditing requirements.

3.1. PROTECTING AND PERPETUATING OLDGROWTH TREES

Large old trees provide essential resources for numerous Australian species, including many threatened species. Large old trees have limited lifespans, so there is a requirement to ensure that suitably sized trees are available to replace them when they die. A key requirement for the survival of a plethora of native species, including a variety threatened with extinction, is the retention and restoration of a natural distribution of tree age classes across the landscape. Unfortunately a war of attrition is still being waged against large old trees, and throughout extensive areas many of the age classes required provide the replacement large old trees of the future are absent or severely depleted. The decline of large old trees is being exasperated by climate change.

Oldgrowth trees are the primary storehouses of carbon, provide essential hollows for animals to nest and den in, provide the most abundant nectar and seed, and are of the highest aesthetic appeal. These values appreciate with age. Oldgrowth forests are those with a high proportion of relatively old trees.

Hollow-bearing trees, and with them hollow-dependent species, have already been decimated within vast tracts of forests. The problems such fauna are facing are expected to exponentially worsen as the few remaining large old hollow-bearing trees (in both forests and pastoral lands) die-out without replacement trees being available. The full ramifications of irreversible changes already set in place will take a century or more to become fully manifest.

Lindenmayer et. al (2012) note “Large trees are keystone structures of forests ... and their density and distribution can significantly affect the temporal and spatial dynamics of cavity-dependent fauna”, stating:

> *Large trees with cavities play critical roles in forest, agricultural and urban ecosystems worldwide .... These roles include: storing carbon ...; creating distinct microenvironments characterized by high levels of soil nutrients, plant species richness and structural complexity ...; and providing nesting and sheltering habitat for numerous animal species (.350 mammal species globally) ... including up to 30% of the vertebrate biota in a given vegetation type .... Large trees with cavities can take a prolonged time to develop – more than century in Douglas-fir (Pseudostuga menziesii) trees in western North America ... and the vast majority of Australian eucalypt species ...However, many ecosystems worldwide are increasingly characterized by the rapid loss of large trees with cavities, a failure to recruit new trees with cavities, or both .... Many kinds of human disturbances cause this problem, including recurrent logging, altered fire regimes, grazing by domestic livestock, and the impacts of exotic plants. The loss is global, occurring in North America ..., South America ..., Europe ..., Asia ..., and Australia ....*

A plethora of forest animals depend upon the trunk and branch hollows provided by big old trees for their survival. Approximately 20% of the Australian bird fauna, 75% of arboreal marsupial fauna and an undetermined proportion of the bat, reptile and invertebrate fauna are dependent on the hollows provided by old trees for roosts, nests and shelter. Gliders, possums, ducks, kookaburras, owls, tree martins, parrots, kestrels, falcons, kingfishers, echidnas and bats are some of the wildlife species that use tree hollows.

Although the outer living skin of the tree may remain healthy, the inner dead wood can be digested by fungi and excavated by water, be chewed up and carted away by termites or burnt out by fire.

The resulting hollow branches and trunk provide the hollows used by wildlife. Many species of wildlife will further fashion the trunk using beak, teeth or claws. Animals do not select hollows at random; factors such as entrance size and shape, depth, degree of insulation, etc. greatly affect the frequency and seasonality of hollow use.

Hollows in fallen timber are also used by wildlife. Some native fish use hollow logs in streams for shelter and egg attachment. Under-bark 'hollows' are used by bats, lizards and invertebrates.

One hollow may be used by more than one species in a year. One individual may use several hollows. For example, individual Squirrel Gliders were found to use up to six hollows over a twelve month period.

As a general guide, three to ten hollow-bearing trees, with as many as thirty hollows, may be required per hectare to support a diverse wildlife population.

The NSW Scientific Committee has identified *Loss of Hollow-bearing Trees* as a Key Threatening Process. The highest priority action for this KTP is "*Adopt appropriate policies for recruitment tree ratios with a stipulated minimum retention density in areas of forestry operations"*.

The loss of the hollows provided by large old trees has been identified as a primary threat to a variety of priority species in north east NSW (Environment Australia 1999); 4 mammals (non-flying), 20 bats, 3 birds, 2 frogs, 3 reptiles and 4 snakes. Numerous other species have been identified as threatened by the loss of other resources (i.e. seeds, nectar, nest sites) provided in greater abundance by older trees and many by the increased transpiration of young trees and consequent reduction in water availability (Environment Australia 1999).

Riverine eucalypt woodland is dominated by River Red Gum (*Eucalyptus camaldulensis*), Coolibah (*Eucalyptus microtheca*) and Black Box (*Eucalyptus largiflorens*) along the major rivers and their adjacent floodplains. In western NSW riverine eucalpt woodland has been identified as supporting the most bird species relative to its extent and thus the most critical ecosystem for maintaining bird diversity. 15 birds that nest in tree hollows, and 20 species which nest in trees, have decreased within western NSW's riverine woodlands in recent times.

It is important to recognise the outstanding contribution of big old trees to storage of carbon in forests. The loss of large old trees contributes to climate change, and climate change contributes to the loss of large old trees. For example Roxburgh *et.al.* (2006) found:

> *In mature forests, large diameter trees greater than 100 cm d.b.h. comprised 18% of all trees greater than 20 cm d.b.h. and contained 54% of the total above-ground carbon in living vegetation. ... The influence of large trees on carbon stock therefore increases with their increasing size and abundance.*

Generally speaking, small hollows begin to develop once a eucalypt is over 100 years old, and the large hollows required by many species after a tree is over 200 years old. Depending on the species and site conditions trees may live for 300 to over a thousand years, providing their lives are not cut short. For blackbutt forests Mackowski (1987) found (p118) that only hollows in trees greater than 100 cm. dbhob (144 years old) were utilised by wildlife and that larger species *"such as ducks, cockatoos and owls ... are probably restricted to nesting in blackbutt > 140 cm dbhob as larger hollows mainly occurred in these trees.",* (p115) *"... these hollows were not suitable for large hollow dependant wildlife unless the blackbutt was > 224 y.o."* and (p119) *"Arboreal marsupials the*

size of yellow-bellied glider and larger appear to require hollows > 100 cm^2 entrance size, these hollows only occur in blackbutt > 100 cm dbhob and are most abundant in blackbutt > 140 cm dbhob". Mackowski found that the large hollow bearing trees would only persist for 80 or so years, necessitating replacement large hollowing-bearing trees to become available.

On public lands trees over 140 years old generally predate the commencement of logging (except for Red Cedar and possibly some select individual trees) and thus are remnants of the original forest. As well as being important for sustaining populations of hollow-dependent fauna, such trees are part of our natural heritage and the relatively few that remain should be retained.

The inquiry needs to recognise that the maintenance of large old hollow-bearing trees in perpetuity is a key requirement for the survival of numerous Australian species, including many species already identified as threatened with extinction.

NEFA recommends the Inquiry recognise the current and worsening crisis in the availability of large old trees and the essential resources they provide to numerous fauna species, and recommend the retention and protection of all large old trees (>140 years old) for their biodiversity and heritage values.

3.1.1. MAINTAINING HOLLOW-BEARING TREES IN PERPETUITY

In order to provide for hollows through time it is necessary to protect those trees with existing large hollows, as well as sufficient trees in the next age class to replace them when they die, and trees in the next age class to replace the replacements. Successional planning is an essential requirement of ecologically sustainable forest management, particularly as most logged forests have a deficit of large hollow-bearing trees and the next age class required to replace the few that are left as they die out.

It has long been recognised that to mitigate the impact of logging operations upon some hollow-dependent fauna it is necessary to manage for provision of habitat trees in perpetuity (i.e. Saunders 1979, Recher, Rohan-Jones and Smith 1980, Mackowski 1984, 1987).

Trees retained as potential recruits for habitat trees will also suffer premature mortality. In natural forest there is a self thinning process that results in significant mortality (Mackowski 1987). Though there is also a high likelihood of mortality due to other factors. As noted by Mackowski (1987 p124) *"the frequent occurrence of fire in this site height blackbutt forest precludes a 100% chance of survival - a proportion will be damaged, or weakened, or burnt down by each fire. These trees are also subject to the risk of lightning and windstorm damage."*

To comply with habitat tree retention prescriptions and the requirement to maintain habitat trees in perpetuity there is a necessity to detail prescriptions for potential replacement trees to be retained sufficient to maintain the prescribed number of habitat trees over long time frames (Recher, Rohan-Jones and Smith 1980, Mackowski 1984, 1987, Recher 1991, Scotts 1991, Traill 1991).

Mackowski (1987) and Smith (1999) provide evidence that in natural forests there is a natural mortality rate in the order of 50% of trees between each age class, with mortality rates increasing

with age and increasing due to declining site quality. This means that in a natural forest, in order to retain one tree in an age class, there is a need to retain at least twice as many trees in the next youngest age class. Mackowski's (1987) assessment was that Blackbutt forests had a 50% mortality between 80 year age classes.

TABLE COASTAL BLACKBUTT RETENTION RATES REQUIRED TO MAINTAIN 10 HABITAT TREES PER TWO HECTARES IN PERPETUITY. The assumption is made that there will be 50% mortality of recruitment trees every 80 years. Adapted from Mackowski 1987.

Diameter (dbhob) cm.	Age yrs	Time-span in size class yrs	Mackowski's requirements for 3 Habitat Trees per Hectare over 100cm	Requirements to retain 10 Hollow-bearing Trees per Two Hectares
20-60	16-68	52	11.5	38.3
60-100	68-144	76	4	13.3
100-140[A]	144-224	80	2	6.6
140-180[B]	224-304	80	1	3.3

A - stage at which hollows suitable for small wildlife form.
B - stage at which hollows suitable for large wildlife form.

Mackowski (1984) considered *"The general pattern of hollow formation in many gum type eucalypts, ironbarks, bloodwoods and stringybarks is similar to that described for Blackbutt. Tallowwood and Brushbox have similar crown architecture characteristics to Blackbutt but have substantially different suites of organisms involved in the succession towards hollows, leading probably to much older age at hollow formation."*

Smith (1999) identified the averaged structure of natural native forests according to tree size class and site productivity in eastern NSW.

Table: Smith (1999) Number of stems (all species) per hectare and stand basal area (square metres per hectare) in increasing diameter classes in unlogged or "old-logged" forests.

Productivity Class	20-39 cm dbh	40-59 cm dbh	60-79cm dbh	80-99 cm dbh	>100 cm dbh	Stand Basal Area
1 low	69	24	10.8	2.5	-	18
2 low-mod	80	50	16.7	6	1.3	26
3 mod-high	87	57.4	31.6	11.5	5	43
4 high	64	44.7	14.3	7.6	11.9	47

1. Shading depicts where significant numbers of hollows with an entrance >10 cm diameter and estimated depth >25 cm were recorded.
2. Size classes are based upon diameter at breast height (dbh).

Many forests have been denuded of habitat trees. To enhance such forests for nature conservation and maintenance of ecosystem functioning they need to be managed for the return of adequate stockings of habitat trees (Mackowski 1987). Mackowski (1987 p134) states *"where adequate hollow trees have not been retained in the past, a greater proportion of larger recruits should be selected (rather than evenly distributed between 60 & 100 cm dbhob) to facilitate the early return of hollow trees and the immigration of hollow dependant wildlife if it occurs nearby."*

Over large areas of Australia there is inadequate regeneration of trees – a time bomb quietly ticking away. *"The present generation of hollow bearing trees (mostly large River Red Gums) is gradually*

being lost through death and decay, and current levels of regeneration are insufficient to replace existing trees".

Regarding impacts on Red-tailed Black-Cockatoos, Commonwealth of Australia (2007), state:

> *Estimated rates of loss of paddock trees in south-eastern Australia of up to 40% in 30 years indicate that few paddock trees will survive past the next century if current attrition rates continue (Carruthers and Paton in press). In the south-east of South Australia, paddock tree decline over the next 50 years has been estimated to be as high as 36%, based on authorised clearance records (Carruthers et al. 2004) and regional dieback estimates, with 65% of the predicted loss from authorised clearance. Research indicates that revegetation offsets are yet to be proven as effective replacement habitat, at least in the short to medium term (Carruthers and Paton in press). Offset plantings of Buloke will not become suitable cockatoo foraging habitat for at least 100 years (Maron and Lill 2004).*
>
> *...*
>
> *Uncontrolled grazing is a major threat contributing to the death and decline of trees on private land throughout the range (Cutten and Hodder 2002). For example, in four paddocks near Naracoorte regularly used for feeding, 76% of stringybarks had some degree of ringbarking caused by cattle, and 15% were dead (R Hill in litt.). Cattle can also kill mature Bulokes (Maron in litt.).*
>
> *...*
>
> *Dead nest trees are falling over at 4 - 7% per year (Hill and Burnard 2001), and this rate is likely to increase as the trees age. Many other dead trees are felled for firewood or when paddocks are cultivated.*
>
> *...*
>
> *In the medium to long-term the continuing loss of dead hollow-bearing trees, lack of regeneration of future hollow-forming trees and declining health of scattered trees on private land are potentially serious threats. Many nest trees are near the end of their lifespan (Gibbons and Lindenmayer 2002) and there is a landscape-scale cessation of eucalypt regeneration in the sheep-wheat belt of south-eastern Australia (Robinson and Traill 1996, Reid and Landsberg 2000). Given that trees containing larger hollows used by Red-tailed Black-Cockatoos are likely to be over 220 years old (Gibbons and Lindenmayer 2002), there is likely to be a serious shortfall in suitable hollow-bearing trees in the decades to come.*

Lindenmayer et. al. (2012) recognise this problem, stating *"In southeastern Australia, millions of hectares of grazing lands are projected to support less than 1.3% of the historical densities of large old trees within 50 to 100 years".*

From their studies of Mountain Ash forests, Lindenmayer et. al. (2012) state:

> *Based on the 1997–2011 transition probability matrix, we projected that by 2039 most sites and particularly those severely burned in 2009 will be overwhelmingly characterized by collapsed trees with cavities (Figure 5). Additionally we project a paucity of standing large trees with cavities on unburned sites and on sites subject to moderate severity fire (Figure 5). These patterns were further magnified by 2067.*
>
> *High levels of tree death were documented in this investigation both on burned and (surprisingly) unburned sites (Table 2; Table S1). On severely burned sites, almost 80% of the large cavitybearing trees alive in 1997 were dead 14 years later....*

We found that 14% of living, large trees with cavities on unburned sites died between 1997 and 2011. These results are of great concern given that we estimated that the vast majority of large living trees in our study were 150–300 years old and we expected that the majority of them should remain alive for an average of 300–500+ years [55]. Thus, the patterns of mortality we observed have the potential to substantially truncate the lifespan of living trees with cavities (Table 2) ...

Our data on tree mortality, rates of tree decay and collapse, and lack of recruitment of new large cavity trees in Mountain Ash forests are strong evidence for rapid development of a regional ecosystem universally depauperate in large cavity-bearing trees....

Regrowth forests are characterized by a rapidly declining large cavity-bearing tree population because of: (1) High rates of mortality among large living cavity trees; (2) Extensive losses (57–100%) of large dead cavity-bearing trees that were legacies from stands burned in 1939 or logged in the past few decades and then burned in the 2009 wildfires (Supplementary Information S3). And (3) a long interval (50–120 years) before new large cavity-bearing trees will begin to be recruited into existing stands established in 1939 – and longer again in even younger stands (Figure 5).
...

We suggest that the large cavity tree crisis in Mountain Ash forests could be prolonged – possibly exceeding 100–150 years in large parts of the Central Highlands region....

Significant negative ecological consequences will arise from the Mountain Ash-wide absence of large cavity trees. These consequences include: (1) Simplified stand structures (sensu [86]), which will lack suitable habitat for many native biota [37,87,88]. (2) Reduced levels of carbon storage [8]. And (3) impaired key ecosystem processes like the recruitment of large logs to the forest floor [7,89]. In the particular case of Mountain Ash forests, a paucity of large-diameter dead trees will deplete the nesting and denning resources required by ,40 species of cavity-dependent vertebrates in these ecosystems.

Past work has highlighted strong relationships between the abundance of large trees with cavities and the presence and abundance of many species including the endangered Leadbeater's Possum [33,90]. ...

The Inquiry needs to recognise that the current crisis over extensive forested landscapes in the availability of large old trees, and the essential hollows they provide to numerous species, is worsening as remnant large old trees die or are killed without recruitment trees being available to replace them. The inquiry should identify the tree retention requirements across the range of age classes necessary to provide an adequate stocking of large old trees throughout native forests into the future.

3.1.2. LOGGING PRESCRIPTIONS

In north-east NSW the Threatened Species Licence requires the retention of a minimum of 10 large old hollow-bearing trees (where extant) per 2 hectares when logging on public lands. Under the TSL retained hollow-bearing trees must be selected from the trees with the largest dbhob and must be live trees and should have good crown development and minimal butt damage (TSL 5.6 a, c).

It needs to be recognised that the retention of 10 hollow-bearing trees per 2 ha is inadequate to maintain biodiversity, as noted by Smith (2000);

> *Current prescriptions require the maintenance of at least 5 habitat trees per hectare. This is less than 30% of the average stocking of habitat trees in unlogged native forest. Loss of habitat trees is the single greatest cause of biodiversity reduction in logged forests. If all habitat trees in unlogged native forest were fully utilized a 70% reduction in abundance of hollow dependent fauna could be expected in logged forest under current standards. … This finding suggests that current standards for habitat tree retention are inadequate to maintain the natural diversity of hollow dependent fauna in logged forests. However, retention of higher densities of habitat trees is likely to significantly reduce timber yields.*

The need for retention of hollow-bearing trees in perpetuity is the intent of the requirement of NSW's Threatened Species Licence requirement to retain a "mature to late mature" recruitment tree for each hollow-bearing tree. In the hinterland forests the intent is to restore such habitat trees where they are no longer available, though in the coastal forests the requirement is only to retain any surviving hollow-bearing trees, it is a prescription for elimination. While the requirement is clearly for retention within each 2 hectares, the EPA also allow this to be averaged across the logging area so that all retention requirements can be met in one part of the area.

While the aim of this prescription is to retain large hollow-bearing trees in perpetuity, in the absence of an intent to manage native forests so as to retain the range of size classes it cannot achieve this aim.

Retained trees are more vulnerable to windthrow and post-logging burning (Saunders 1979, Recher, Rohan-Jones and Smith 1980, Mackowski 1987, Smith and Lindenmayer 1988, Milledge, Palmer and Nelson 1991, Smith 1991a). In many areas trees marked for retention as habitat trees have been found to include dead trees and trees burnt out at the base and unlikely to remain standing for long. Logging debris are often left stacked against the bases of trees which will help ensure their rapid demise.

Recruitment trees are required to be mature to late mature growth stages, to have good crown development and minimal butt damage, and also to not be "suppressed" (TSL 5.6 b, d). Suppression occurs when trees are out competed by adjoining trees and become consequently stunted and deformed, which can persist after the competing trees are removed.

Retained trees must be scattered throughout the logging area. The TSL (5.6 g) requires damage to retained trees to be minimised and that *"logging debris must not, to the greatest extent practicable, be allowed to accumulate within five metres of a retained hollow bearing tree"* or recruitment tree. Retained trees are also required to be marked for retention prior to logging.

In our first audit of Doubleduke (Pugh 2010b) we found logging underway in Compartment 146 without hollow-bearing and recruitment trees being marked. We complained at the time. When we returned after logging had finished we found that the hollow-bearing trees that had survived had subsequently been marked. Though it appeared to us that retention requirements had not been met.

At another area in Doubleduke (Pugh 2010b) where tree retention appeared deficient, a large senescent hollow-bearing tree had been felled while nearby damaged late-mature trees without significant hollows had been marked as hollow-bearing trees for retention.

PHOTOS :TREE RETAINED AS A HOLLOW-BEARING TREE IN A WILDLIFE CORRIDOR IN AN INFORMAL RESERVE (FMZ3B) IN GIRARD SF. ASIDE FROM BEING HALF DEAD THE TREE HAD NO HOLLOWS AND IS NOW INCAPABLE OF FORMING THEM. HEALTHY HOLLOW BEARING TREES WERE LOGGED NEARBY,


PHOTOS: DESPITE THERE BEING A PLETHORA OF LARGE HOLLOW-BEARING TREES TO CHOOSE FROM IN STYX RIVER SF, FORESTS NSW INTENTIONALLY CHOSE MANY SEVELY DAMAGED TREES UNLIKELY TO SURVIVE LONG AND OTHERS TOO SMALL TO HAVE HOLLOWS.


PHOTOS: TREES REQUIRED TO BE RETAINED AS RECRUITMENT HOLLOW-BEARING TREES ARE OFTEN TOO SMALL OR DAMAGED TO BE ABLE TO REPLACE THE OLD TREES AS THEY DIE OUT, AS IN STYX RIVER SF.

PHOTO: AT YABBRA SF THE RECRUITMENT TREES WERE OFTEN SMALL SUPRESSED TREES INCAPABLE OF FUTURE GROWTH, WHILE THE RETAINED HOLLOW-BEARING TREES WERE SEVERELY DAMAGED AND UNLIKELY TO SURVIVE LONG. THIS IS DELIBERATE TOKENISM.

In a third area in Doubleduke (Pugh 2010c) it was found that an average of 1.9 hollow-bearing trees, and 1.3 recruitment trees, per hectare had been marked for retention. A measurement of all trees and stumps in a subset of this area found that sufficient trees had been retained to meet retention requirements, though 3 of the 7 largest trees had been logged. In this area it appeared that someone had walked along a track and the boundary of the nett harvesting area marking habitat trees in an ad-hoc manner as they went, without venturing far into the logging area.

In one area at Girard (Pugh 2010d) trees and stumps were measured to quantify tree retention standards. In that area the density of Greater Gliders exceeded 1 per hectare so the TSL owl prescription (6.9d) required the retention of 8 hollow-bearing trees per hectare and the general recruitment tree prescription required the retention of 10 mature/late mature recruitment trees per 2 hectares. It was found that while there were originally 7.8 large old (late mature/senescent) trees per hectare they only retained 4.8 per hectare, and of the next size class (mature/late mature) there were originally 19 per hectare but only 3.9 per hectare were retained. Insufficient trees were retained to satisfy TSL licence requirements. It is important to recognise that the area measured was oldgrowth forest within a special prescription zone, with tree retention generally appearing significantly lower elsewhere in the compartment.

PHOTOS: HOLLOW-BEARING AND RECRUITMENT TREES, LIKE THESE IN GIRARD SF, OFTEN HAVE DEBRIS LEFT STACKED AROUND THEIR BASES TO ACT AS FUNERAL PYRES. DEBRIS IS REQUIRED TO BE REMOVED FROM WITHIN 5 METRES THOUGH EPA RARELY ACTS ON FREQUENT COMPLAINTS.

PHOTOS: HOLLOW-BEARING TREES ARE OFTEN BURNT OUT IN POST-LOGGING BURNS, AS IN YABBRA SF, WHICH OFTEN APPEARS TO BE THE INTENT.

In another area at Girard (Pugh 2010d) only three hollow-bearing trees and two recruitment trees were marked for retention in a 3.7 ha area, giving a retention rate of one hollow-bearing tree per 1.2ha and one recruitment tree per 1.4ha. In this case there were additional trees available for marking though these were not quantified. It appeared that, even with the inclusion of the unmarked trees, that retention was still deficient. It appeared that someone had walked along the track only marking easily accessible hollow-bearing and recruitment trees in the vicinity of the track. Near the end of the track a "clump" of trees had been marked in an attempt to improve counts.

In part of Royal Camp State Forest (Pugh 2012e) the requirement was to retain 10 hollow-bearing and 10 recruitments trees per 2 ha. In one 5 hectare area only one tree was marked for retention. In a 2.3ha sample to assess tree retention from a randomly chosen multi-aged part of the stand, only 4 out of the 11 required hollow-bearing trees were marked and retained and only 5 out of the 11 required recruitment trees were marked and retained, none of the 11 required were marked as eucalypt feed or Koala feed trees. Of the total of 16 trees removed that were over 40 cm dbhob and thus likely to have been mature, late-mature or senescent, at least 11 should have been retained as hollow-bearing or recruitment trees and should not have been logged.

In most of Royal Camp, Forests NSW was only required to retain the existing numbers of hollow-bearing trees and one recruitment tree for each of these. Over large areas Forests NSW intentionally marked every second hollow-bearing tree as a recruitment tree, effectively only protecting half the numbers of trees they were required to retain, and not retaining the needed recruits from the mature age class (Pugh 2012e).

Contrary to licence requirements retained hollow-bearing trees often have butt damage. Trees retained as recruitment trees are commonly too young and too suppressed to satisfy licence requirements. At both Yabbra and Doubleduke (Pugh 2009, Pugh 2010b) it was found that marked recruitment trees were often suppressed regrowth trees with poor crown development . At one site at Girard (Pugh 2010d) 2 hollow-bearing trees and 7 recruitment trees were classed as suppressed, and one recruitment tree had 60% of its butt severely damaged. At the other site 1 hollow-bearing tree and 1 recruitment tree had significant butt damage.

At both Yabbra and Doubleduke (Pugh 2009, Pugh 2010b) it was found that retained trees often had large amounts of debris felled and pushed around their bases. At one site at Girard (Pugh 2010d) 8 of 13 hollow-bearing trees and 7 of 10 recruitment trees had significant amounts of debris dropped or pushed around their bases. At the other site all five marked trees had significant amounts of debris left around their bases.

There is a war of attrition against hollow-bearing trees being waged. Their numbers are being depleted by continued logging, the required replacements are not being retained and funeral pyres are regularly being constructed around them in apparent attempts to burn them to the ground. We consider that the damage being caused to hollow-bearing and recruitment trees is contrary to the basic precepts of sustainable logging.

Most tree retention prescriptions are set “per 2 hectares” which both EPA and Forests NSW take to mean that this is the average density needed to be retained across a whole compartment. Tree retention can be assessed by randomly chosen representative samples, though the EPA has so far refused to do so. They prefer to claim that it can’t be assessed without auditing a whole compartment. The original intent was that Forests NSW should retain the required number of habitat trees within every two hectares, where available. Unless a more systematic approach involving recording a GPS location for every retained tree is adopted, the wording of prescriptions need to be changed from “per” to “in every” 2 hectares to make prescriptions readily implementable and auditable.

There are a variety of other tree retention requirements including

- 6 mature and late mature eucalypt feed trees for nectivorous species in every two hectares of the net logging area where they occur (increased to ten eucalypt feed trees near records of the most vulnerable nectivores);
- 10 primary Koala browse trees per 2 hectares of any size in identified “intermediate habitat”;
- 15 mature and late mature feed trees within 100 metres of a Yellow-bellied Glider sap feed tree, observation or den site record, or within 200m of a call detection record;
- Yellow-bellied and Squirrel Glider sap feed trees;
- roosts, dens and nests of various bats, owls and gliders (if found);
- all hollow-bearing trees and stags within 100m of Pale-headed Snake; and,
- ten stags (dead trees) per 2 ha where they occur and are not considered dangerous.

The evidence from our audits is that such trees are rarely identified or protected, except where they happen to also qualify as a hollow-bearing or recruitment tree. Their protection would be better served by retention of all large old trees and maintenance of trees through a range of size classes across the forest.

Despite retention requirements being specified during some logging operations for the retention of hollow-bearing trees, and recruitments to grow into the hollow-bearing trees to replace them when they die, the achievement of

requirements are often grossly inadequate and there appears to be a war of attrition being waged against hollow-bearing trees. The aim should be to retain, maintain or restore hollow-bearing trees and adequate recruits throughout native forests.

3.2. THE KOALA – A CASE STUDY IN MISMANAGEMENT

In March 2011 NEFA made a submission to the Federal *Inquiry into the Australian forestry industry* that was tasked with considering the environmental impacts of forestry, we had hoped that the Inquiry would consider our evidence and take action to ensure that prescriptions required to be implemented to protect nationally threatened species were faithfully applied in future. However our evidence on Koalas and other threatened species to the 'inquiry' was completely ignored.

On the 16 May 2012 NEFA wrote to the Federal Environment Minister, Tony Burke, to highlight the inadequate protection provided for Koalas in logging operations in north-east NSW, and to request that he require a strengthening of logging prescriptions on both public and private lands to provide meaningful protection for the recently listed vulnerable Koala. To no avail we pleaded:

> *In order to arrest the ongoing decline in Koala populations it is apparent that there is a need to urgently delineate and protect from logging core Koala habitat, protect known localities of Koalas and to increase the retention of mature feed trees throughout the Koala's preferred forest types. To achieve this NEFA is asking you to intervene with two basic aims:*
>
> 1. *To require the current Koala prescription for private forests be applied to public forests.*
> 2. *To ensure that a precautionary approach is applied by requiring the assumption that Koalas and areas of core Koala habitat occur in preferred Koala forest types until proven otherwise.*

The NSW Recovery Plan for the Koala (DECCW 2008) identifies that the loss and degradation of habitat is the most significant threat facing NSW koala populations. Koalas have been found to have a preference for mature trees of specific species in the size range 30-80cm (DECCW 2008). In the Comprehensive Regional Assessment, undertaken jointly between the Commonwealth and NSW Governments in north-east NSW, a significant threat to Koalas was identified (Environment Australia 1999) as *"Logging that fails to retain stems in the 30-80 DBH size class".*

Logging of public lands in north-east NSW is undertaken under the auspices of the joint State and Commonwealth Regional Forest Agreement for North East New South Wales (Upper North East and Lower North East Regions) signed in March 2000. The RFA (Clause 60, Attachment A, and Attachment 3) relies upon the Integrated Forestry Operations Approval to provide for the protection of rare or threatened flora and fauna species, such as the Koala, to satisfy both Governments' responsibilities for threatened species.

In accordance with the RFA, the *Integrated Forestry Operations Approval (*IFOA) incorporates a Threatened Species Licence (TSL) that licenses Forests NSW to harm or kill Koalas and other threatened species in NSW. The licence requires that certain measures be implemented to reduce impacts on Kolas in logging operations.

The Threatened Species Licence (TSL 8.1) for north-east NSW requires that Pre-logging and Pre-roading Survey Reports must compile records for those species that require the implementation of species-specific prescriptions, such as Koalas, and that surveys must be undertaken for them. Our audits have found that Forests NSW often fail to include relevant Koala records in pre-logging and pre-roading survey reports.

The Threatened Species Licence (TSL 5.2.2 a) requires that in compartments which contain "preferred forest types" for Koalas, marking up must be conducted at least 300 metres in advance of

harvesting operations, with an adequately trained person thoroughly searching for Koala scats (faecal pellets) around the bases of feed trees at ten metre intervals (TSL 5.2.2 b).

NEFA's audits (see next subsection) have clearly established that, in many areas of "preferred forest types" for Koalas, Forests NSW do not undertake mark-up surveys, and where they do they are often limited to the marking of peripheral exclusion zones, with little marking up away from boundaries. This means that in these areas FNSW are not undertaking the searches needed to find evidence of Koalas.

The triggering of Koala protection is dependent upon mark-up searches finding sufficient Koala scats to identify Koala "high use" and "intermediate use" areas. The trigger for identifying "high use areas" is effectively where "*three out of any ten consecutive trees inspected are found to have Koala scats beneath them"*. Where identified, "high use" areas are required to be fully protected (TSL 6.14 c). In Royal Camp State Forest NEFA (Pugh 2012e) found no evidence of Koala scat searches before logging and a Koala High Use Area actively being logged. While our complaint resulted in the suspension of logging in that KHUA, logging was allowed to continue in the adjacent compartment. A subsequent inspection of the area where logging continued found no evidence of Koala scat searches and another KHUA that had been logged (Pugh 2012f). The logging continued. A further assessment found limited evidence of scat searching (presumably carried out in an EPA post-logging audit) and another KHUA that had been logged (Pugh 2012g). (see next sub-section for more details).

The trigger for identification of a Koala "intermediate use" area is effectively where Koala scats have been detected under two of any ten consecutive trees, or the area of a compartment outside a "high use" area. In "intermediate use" areas 10 browse trees per 2ha are required to be retained and marked for retention. (TSL 6.14 c). Primary browse trees are select species of any size, where these are not available secondary browse species >20cm are to be retained. The failure to target trees in the 30-80cm size class for retention makes this prescription almost useless. Forests NSW also maintain that the required trees can be retained in a cluster anywhere in the intermediate use area and so rely upon incidental protection.

Our experience is that Forests NSW are under-identifying "intermediate" and "high" use Koala areas because they often do not undertake the required searches for scats. We also doubt that when they do undertake markup surveys they are spending the time required for *"thoroughly searching the ground for scats within at least one metre of the base of trees greater than 30 centimetres dbhob"*. Having a prescription reliant on searches during compartment mark-up is of no value if Forests NSW does not do marking-up most of the time.

The failure to duly consider Koalas in accordance with the Threatened Species Licence has been a common problem in all our four audit areas, yet our complaints have been repeatedly ignored by the Environmental Protection Authority (nee OEH, nee DECCW). For years the EPA ignored our complaints that, in contravention of their licence, Forests NSW were often not collating records of Koalas in their pre-logging and pre-roading survey reports, often not undertaking mark-up surveys for scats, and often not marking the required browse trees for retention.

With respect to Koalas, NEFA's four audits have been random and thus can be considered representative samples of how logging practices in north-east NSW's public forests treat Koalas. As such they clearly showed that there is scant attention paid by Forests NSW and the Environmental Protection Authority to requirements to protect Koalas in the region's public forests. It wasn't until we found active logging in a Koala High Use Area in Royal Camp SF that the EPA was finally forced to investigate Koala protection. Even then they allowed Forests NSW to continue logging Koala High Use areas in adjacent stands despite the required Koala scat searches not being undertaken.

Other local conservation groups have similarly found time and again that little is done to protect Koalas during logging. Boambee State Forest near Coffs Harbour has over 50 records of Koalas, is comprised of “Preferred forest types”, and is almost totally surrounded by privately owned forested land which is mapped core Koala habitat by Coffs Harbour Council. Despite this, conservationists had to pressure Forests NSW to recognise the existence of koala habitat and at least have the area identified as an "intermediate use area". The resultant need to protect 10 feed trees per 2ha has been negated on the first seven compartments logged by the intensity of harvesting which is removing in the order of 80%of the forest’s standing basal area.

While the prescriptions are not being properly implemented, the bigger problem is that there has apparently been no attempt to assess the effectiveness of the Koala prescription (or any other prescription) in the 12 years since the Regional Forest Agreement was signed. The NSW Recovery Plan for the Koala totally ignores the failure of logging prescriptions on public lands to retain trees in the 30-80cm size class it identifies as preferred feed trees (DECCW 2008). It is an example of a “whole of government” approach which ignores inconvenient truths. DECCW (2008) do identify that:

> *Adherence to the general and koala-specific prescriptions of the terms of licence is an integral part of the management of koalas in state forests in NSW. This recovery plan recommends further research to ensure that these prescriptions are effective in conserving koalas and koala habitat.*

The Clarence Environment Centre has found that in Clouds Creek and Ellis State Forests extensive areas of contiguous compartments are being logged again following logging in the late 1990s. Despite there being numerous historical records of Koalas, only a few small “high use” areas have been identified and Koalas are not being relocated in areas where they were previously common, with some such areas now being targeted for removal of 70% of the basal area.

It is apparent that, even if properly implemented, the current Koala prescription for public lands sets too high a threshold for protection of Koala browse trees and core areas. It is a prescription that at best only protects small patches of forest with evidence of very high usage. In most Koala habitat, including where Koala populations have already declined due to past removal of mature browse trees, it allows for increased removal of remaining browse trees. There is no requirement for permanent protection of any identified Koala “high use” or “intermediate use” areas. As identified “high use” areas are isolated in logging operations, and “intermediate use” areas logged (with removal of up to 80% of the basal area), the Koala populations decline, meaning that next time they are logged their status is downgraded. As further degradation of habitat occurs, populations decline further and prescriptions are further reduced. With logging rotations now often only 10 years and sometimes less, it is a prescription for extinction.

For private lands, forest operations are supposedly not permitted within any area identified as ‘core koala habitat’ according to the Private Native Forestry Code of Practice for Northern NSW. Core Koala Habitat is identified in accordance with SEPP44, which defines it as *“an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population”*. This is a significantly lower threshold than applied to identify “high use areas” on public lands.

In accordance with SEPP 44 Coffs Harbour Council prepared a Koala plan of management in consultation with, and assistance of, the National Parks and Wildlife Service (now part of OEH) and the Department of Planning. Those departments have since overseen the logging approvals for core koala habitat on private land. A bureaucratic loophole has seen 1,900 hectares of core koala habitat on the Coffs Harbour Coast logged between 2007 and 2010 and a standoff continues unresolved.

There have been significant differences of opinion between DECCW (now OEH) and Coffs Harbour Council regarding the application of the Council's Koala plan of management that have still not been fully resolved. A Council spokesperson said in 2010: *"We thought our koala POM applied, but DECCW has been saying it doesn't. There are clearly holes in the process and we need to get to the table and sort out where the differences are. We need to get back to the original intent of the plan, which is for the protection of koalas."*

Recently Forests NSW approached all the landholders surrounding Boambeee State Forest offering to obtain approvals from OEH for logging core Koala habitat and to undertake the logging operations. Intervention by Coffs Harbour Council, in accordance with the provision of its Koala Plan of Management has fortunately prevented any of these proposed logging operations from proceeding.

Most Councils do not yet have Koala Plans of Management and have thus not identified core Koala habitat. Outside mapped 'core koala habitat' the Private Native Forestry Code of Practice for Northern NSW requires the retention of 15 food trees over 30cm diameter per hectare of the net harvesting area if a Koala has been recorded within 500m of the logging area (except where the record is on public land). This is three times the retention rate required on public lands (and actually targets the required size class). The problem is that there are no survey requirements so the prescription is reliant upon "wildlife atlas" records, with the right to ignore records from any adjoining public lands – the areas where most surveys have been undertaken. It is thus rarely triggered.

For private forests the Code requires that a 20 metre exclusion zone must be retained around any tree containing a koala, or any tree beneath which 20 or more koala scats are found. For public land there is no requirement to retain individual trees containing, or known to be used by, a Koala. It used to be that if Forests NSW saw a Koala in a tree they would wait for it to move before cutting the tree down, they no longer have to wait for it to move.

The situation with Koalas and diminishment and fragmentation of their habitat due to urban and commercial developments remains a major problem in north east NSW despite SEPP 44 and regional strategies. The Far North Coast Regional Conservation Plan states

> "*Areas supporting known Koala populations should not be developed for urban purposes and in rural areas land use should not be intensified, as research clearly demonstrates that this results in koala deaths, population declines and local extinctions. Councils should zone land known to support viable populations of Koalas for environmental protection. ...*"
>
> *"Several proposed urban development precincts are adjacent to, or encroach upon, known or predicted koala habitat. Development of these areas should be reviewed to ensure that core koala habitat, as defined by SEPP 44, is excluded and that indirect impacts on the mobility and viability of the population due to the position and intensity of the development are fully mitigated.*
>
> *"To promote a strategic approach to kola management, comprehensive koala plans of management should be developed according to SEPP 44. ... Development of* [known or predicted koala habitat] *should be reviewed to ensure that core Koala Habitat, as defined by SEPP 44, is excluded and that indirect impacts on the mobility and viability of the population due to the position and intensity of the development are fully mitigated*" (5.2)

The intent of State Environmental Planning Policy Koala Habitat Protection (SEPP 44) is to require the preparation of Koala plans of management before development consent can be granted in relation to areas of core Koala habitat. SEPP 44 also requires Councils to include core koala habitat within an environmental protection zone and to control surrounding development.

Currently the NSW Department of Planning and Infrastructure is considering a proposal for a major residential and commercial development at West Byron on the outskirts of Byron Bay. In 2010 Biolink Ecological Consultants surveyed the site and recorded Koala activity at 12 of 14 field sites, observed two Koalas and identified Core Koala Habitat. To check Biolink's results AWCG spent 3 nights spotlighting in Nov 2010, observing 2 Koalas one night and one on the third night. They also undertook scat searches at 36 survey plots, recording Koalas at 11 plots. The Ecological Study for the West Byron proposal states:

> *Core Koala habitat is likely to occur, and therefore a Plan of Management would be required for the future development of the site once the rezoning process has been finalised.*

The proposed rezoning requires clearing of half a hectare of identified Koala habitat (as well as an unassessed amount for a drain) and allowing high density development surrounding the rest. This is within a key corridor linking Koala populations to the north and south of Byron Bay. Despite SEPP 44, the DP&I considers that a Koala Plan of Management is not required until after the Minister for Planning approves the destruction and fragmentation of Koala habitat required to implement the proposed local environmental plan.

Similarly, on the Director-General of DP&I's advice the Minister for Planning recently approved a "Cultural Events Site at Tweed Valley Way and Jones Road, Yelgun" (in Byron Shire) despite the presence of primary Koala habitat, the previous identification of core Koala habitat, and the fact that the development was within a regionally significant corridor linking coastal and hinterland Koalas. The Director General similarly did not consider that the required Koala Plan of Management needed to be prepared until after the development is approved, stating:

> *... the recommended conditions of approval require the Draft Vegetation Management and Biodiversity Plan provided as part of the EA to be updated to include a revised KPoM prior to the commencement of any events carried out at the site. The updated KPoM is required to address the operation of ongoing events carried out at the site and the potential impacts that this will have on any areas of core Koala habitat and existing Koala populations.*

The preparation of Koala Plans of Management after developments and their impacts on core Koala habitat have been approved makes SEPP 44 a sham. At the same time as the Commonwealth is spending $2 million over five years through the Biodiversity Fund to link key koala habitats along the Tweed and Byron coasts the NSW Government is busily fragmenting and degrading it.

NEFA considers that the efficacy of Koala prescriptions, plans and policies for both public and private lands, and their implementation needs to be reviewed and improved. For maintenance and recovery of Koala populations we need a prescription that provides permanent protection for core nodes throughout the Koala's distribution, encourages the maintenance and restoration of browse trees, and facilitates the movement of Koalas throughout the landscape. It is apparent that this can only be achieved by new prescriptions that enhance the availability of mature feed trees and require the preparation of Local Koala Management Plans that identify, rehabilitate and protect core Koala habitat before it is degraded or developed.

The Pine Creek Koala Management Plan is the first and only Koala Plan of Management prepared by Forests NSW in response to strong community pressure. In 2002 about two thirds of Pine Creek State forest was transferred to Bongil Bongil NP but the remainder is still managed for timber production as native forest and plantation. NSW has now cancelled the Pine Creek Koala Management Plan. This is despite the NSW Government's Koala Plan of Management having an action to expand the preparation of multi tenure Koala Plans of management including over state forests.

NEFA considers that in order to provide meaningful protection for Koalas there is a need for enhanced prescriptions in logging operations. It is suggested that the Inquiry recommend a more appropriate approach to Koala conservation in north-east NSW that incorporates the following elements:

1. **All trees with Koalas in them, or evidence of use (scratch marks, scats), must be retained and appropriately buffered.**
2. **Fifteen Koala browse trees in every hectare of the net logging area must be retained within all "preferred forest types" for Koalas, unless the EPA determines that surveys by an appropriately trained fauna expert have reliably identified that it is not potential Koala habitat. Retained Koala browse trees must have good crown development, should have minimal butt damage, and should not be suppressed. Mature and late mature trees, >30cm diameter, must be retained as Koala browse trees where available. Where such trees are not available then suitable recruitment trees must be retained.**
3. **A Local Koala Management Plan must be prepared and approved by the EPA before undertaking any logging or development within "preferred forest types" for Koalas. The Plan must identify core Koala habitat to be excluded from logging or development and necessary connecting corridors. The plan must be exhibited for public comment.**

We consider that this approach is consistent with the following Commonwealth identified management actions for Koalas:

- Survey and research to assess and map Koala populations and habitat
- Identification, protection and management of habitat, incorporating buffer or protection zones around prime habitat and the use of habitat links
- Habitat restoration and re-establishment of Koala feed trees in protection zones and in areas where clearing threatens the long-term persistence of local populations
- Implementation of appropriate burning, logging, water-flow (particularly in arid areas) and grazing regimes to ensure the maintenance of known or potential habitat

3.2.1. DELINEATING HIGH QUALITY KOALA HABITAT

One of the basic requirements of the Threatened Species Licence is the Compartment Mark-up Surveys (TSL 5.2.). Under the TSL (5.2.1d) Harvesting Operations are prohibited in areas which have not been subject to compartment mark up surveys. At this time *"an adequately trained person must conduct a thorough search for, record and appropriately mark … threatened and protected species features".* These features include nests, roosts and dens of a variety of hollow-dependent species, Koala high use areas, latrine and den sites of the Spotted-tailed Quoll, Glossy-black Cockatoo feed trees, Yellow-bellied Glider and Squirrel Glider sap feed trees, bat tree roosts, Swift Parrot and Regent Honeyeater feed or nest trees, wombat burrows, soaks and seepages in Philoria spp. habitat, and threatened flora. This is a key step in providing the intended protection to a range of threatened species. It is only by undertaking the required on-ground assessment that the features can be found that that trigger a variety of prescriptions.

In Yabbra State Forest (Pugh 2009) NEFA found that not a single one of the required Koala browse trees had been marked and that none of the numerous Yellow-bellied Glider feed trees required to be marked had been. NEFA complained that this failure to mark feed trees was evidence that no

compartment mark up survey had taken place. While OEH (then DECCW, 19 May 2010) issued Forests NSW a penalty notice in regard to the failure to mark Yellow-bellied Glider feed trees they made no mention of the failure to mark Koala browse trees. Following additional complaints DECCW (3 August 2010) stated *"...at the time of harvesting, Forests NSW officers documented numerous instances of impenetrable understorey hindering the ability to mark up exclusion zones and habitat features"*. NEFA considers that many of the areas where marking up did not take place did not have an impenetrable understorey.

At Doubleduke (Pugh 2010b) NEFA again found that many areas had not been adequately marked-up. It was apparent that only the periphery of logging areas had been marked up in most areas, with no attempt to undertake tree marking within the logging area until after logging was completed. This implies that there had been no pre-logging mark-up Koala scat searches. At one site, where logging had only recently commenced, it was obvious that there had been no attempt to mark-up within the net logging area or search for Koala scats. In an effort to stop this unlawful logging we wrote to the ministers and issued a media release. OEH issued Forests NSW a caution for failing to adequately mark up an area prior to logging.

At Girard (Pugh 2010b) NEFA again found that no attempt had been made to mark-up in significant areas. In response to our complaints OEH (25 August 2011) replied:

> *OEH identified that thick impenetrable vegetation was present within the harvest areas. Where such vegetation occurs, Forests NSW is not required to mark up the harvest area (including in advance of the operation in preferred koala habitat) due to occupational health and safety considerations. Forests NSW has documented and justified the reasoning behind not marking up the compartment in accordance with the requirements of the TSL.*

At Girard many of the areas where NEFA found tree marking had not occurred were not impenetrable and were not identified as such by Forests NSW on maps shown to us.

At Royal Camp (Pugh 2012e) NEFA found that mark up was limited to hollow-bearing and recruitment trees, with many hollow-bearing trees marked as recruitment trees and some cut down. No marking of yellow-bellied Glider feed-trees had been done and the only Yellow-bellied Glider sap-feed tree we saw had been logged. No marking of Koala feed trees had been made and there was no evidence of anyone having undertaken thorough pre-logging mark-up surveys for Koala scats. .

The TSL (5.6 g iii) does allow for tree mark-up not to take place *"where the understorey consists of thick impenetrable lantana greater than one metre high or other impenetrable understorey"*, though this exemption is specifically limited to trees specified in that clause. In practice EPA are allowing it to be applied where there is no impenetrable understorey and to all clauses of the TSL. Though the bigger problem is that without *"an adequately trained person"* conducting thorough searches for threatened and protected species features many species are not being provided with the protection intended by the TSL.

For example the triggering of Koala protection is dependent upon mark-up searches finding sufficient Koala scats to identify Koala "high use" and "intermediate use" areas. If there is no mark up surveys then there is no protection for Koalas. Given the frequent failure to undertake mark-up surveys found in our audits it is apparent that no attempt is being made to minimise impacts on Koalas in many logging operations.

At Royal Camp State Forest NEFA (2012, 6 August 2012) found logging of Koala High Use Areas were occurring due to a failure of Forests NSW to search for Koala scats ahead of logging. The forest had an open understorey, though there was leaf litter and bark under most trees and dense grass – it was easy to tell whether trees had been searched. In one area being logged NEFA identified 23 high use Koala feed trees (as defined by having >20 Koala scats beneath them) where Forests NSW had not identified any. Even after our initial complaint Forests NSW only identified 7 of these trees.

EDGE OF KOALA HIGH USE AREA IN ROYAL CAMP STATE FOREST, WHERE FORESTS NSW HAD NOT IDENTIFIED A SINGLE HIGH USE KOALA FEED TREE NEFA FOUND 23.

While logging was stopped in one area, NEFA (20 August 2012) subsequently found that in an adjacent area Forests NSW another Koala HUA had been logged after NEFA's initial complaint. Forests NSW, while being audited by EPA, were still not searching for Koala scats ahead of logging and thus not identifying high use Koala feed trees, not undertaking the required "star searches" and not identifying and protecting Koala High Use Areas.

NEFA (24 September 2012) subsequently undertook another inspection in Royal Camp which found that yet another Koala HUA had been logged while the area was still being audited by the EPA. Of the 103 trees we searched for scats, only 7 showed any evidence of having been subject to searching before (some of this was animal activity). In at least 2 cases this appeared to have been after logging and it appeared the token searches were undertaken during a post-logging audit by the EPA. It is revealing that the EPA's token audit had failed to identify the Koala HUA, and that they even failed to identify that there were >20 scats beneath one of the trees they partially searched. It is thus evident that Forests NSW again logged a Koala HUA without making any attempt to search for Koala scats – let alone thoroughly search for them under browse trees at 10m intervals - and that the EPA's token auditing failed to identify this.

Logging in Koala High Use Area. This Koala HUA was found on 24 September 2012 after two previous audits had identified 2 other logged KHUA's. In the first photo the Grey Gum in the background was marked as a H tree, had 4 scats beneath it (but was unsearched), has a snig track to the right going into the heart of the KHUA (where logging was extensive) and is 11m from the stump. In the second photo the Grey Gum in the background had 2 scats under it (but was unsearched), is 8m from the stump and has a tree head dropped beside it. The third photo is on the other side of a snig track from the previous photo, had two Koala scats in the small area that could be searched amongst the debris from the tree head dropped around it, and was apparently searched by EPA without any attempt to remove the debris. All these trees are clearly within a KHUA that should have been protected with a 20m buffer.

Protection of Koalas in logging operations is dependent upon searches for them and evidence of their presence (i.e. scats) being undertaken ahead of logging. While searches are required on public land they are rarely undertaken with the consequence that Koala High Use Areas are being illegally logged by Forests NSW, even when the supposed regulator is present in the forest.

3.3. HASTINGS RIVER MOUSE – A CASE STUDY IN MISMANAGEMENT

The Hastings River Mouse *Pseudomys oralis* is restricted to upland open forests and woodlands with grass, heath or sedge understorey in north-east New South Wales and south-east Queensland, it is patchily distributed with seven known genetically discrete populations. The Hastings River Mouse is listed under both State and Federal legislation as an Endangered species.

Habitat alteration and fragmentation of Hastings River Mouse habitat is predominantly a result of frequent fire, forestry activities, clearing activities, grazing and weed infestation (DECCW 2005). The Recovery Plan states:

> *Timber harvesting impacts adversely on the Hastings River Mouse by reducing shelter provided by hollow logs and old-growth stems with butt cavities. Harvesting activities also open up the understorey and create roads and tracks potentially leading to increased predation pressure. The Hastings River Mouse has been found in logged areas (Meek et al 2003), however, the largest and most stable populations located to date occur in unlogged old-growth forest (Townley 2000a).*

For Hastings River Mouse, the CRA expert panel (Environment Australia 1997) identified predation by foxes and cats as the biggest threat to this species, followed by burning.

On their threatened species site DECC identify as threats:

- *Loss of habitat through clearing.*
- *Reduced groundwater and stream flow as a result of clearing or canopy reduction.*
- *Cattle grazing and trampling of preferred habitat, especially close to water.*
- *Too frequent fires, which may destroy or severely reduce species diversity ground cover.*
- *Predation by foxes and feral cats.*

In early December 1991 Dailan Pugh inspected the Stockyard Creek area of Chaelundi State Forest and identified a variety of breaches of logging prescriptions specifically imposed to protect the Hastings River Mouse. Logging had been undertaken within what were meant to be creek side exclusion areas. NEFA complained to the NSW parliament and used this to lobby for the Endangered Fauna (Interim Protection) Act.

Despite the Forestry Commission being shown photographic evidence at the time they put out a press release denying the breaches. Though a subsequent joint inspection with the National Parks and Wildlife Service confirmed nine breaches, such as driving bulldozers along creek beds, felling trees into creeks and logging within exclusion areas. The "Report on Allegations of Breaches of Logging Prescriptions Chaelundi State Forest, Forestry Commission of NSW, January 1992" concluded:

> *"It would appear that these breaches have occurred due to inadequate supervision by both industry and the Commission, of logging operations."*

One outcome was the formation of the Hastings River Mouse (HRM) Recovery Team, which had its inaugural meeting on the 23rd and 24th July 1992. This was the first recovery team for a threatened fauna species formed in NSW. Since its first meeting the HRM Recovery Team repeatedly requested the NPWS to recommend Hastings River Mouse for Federal listing as Endangered. In frustration with the inaction of the NPWS the conservation representative on the Recovery Team (Dailan Pugh) nominated the HRM for federal listing in November 1993.

The Recovery Team implemented a 3 year research program with the aim of finalising a Recovery Plan within 4 years, i.e. by 1996. While the research was completed, the NPWS frustrated the preparation of the plan. After years of procrastination the preliminary draft Recovery Plan was prepared on 19th May 1997 and discussed at the HRMRT meeting of 23rd May. The next meeting of the HRMRT was not until 22nd December 1997, with the draft Recovery Plan not provided until just before that meeting. Concerns with the Recovery Plan were discussed at the meeting with agreement that a revised draft, taking into account concerns raised, would be circulated by 30th January 1998, with the final version to be agreed by the 13th February 1998. The HRMRT did not meet again. The Recovery Plan for the Hastings River Mouse was not adopted until April 2005, thirteen years after it was started and 8 years after the draft plan was prepared.

The Hastings River Mouse was one of those targeted for reservation in the CRA process, with population targets established for 8 discrete populations. These targets were adopted to represent the number of breeding females required to be included in reserves to achieve the long term survival of the species. As with most endangered species the CRA process abjectly failed to deliver on the reservation requirements for this species, with only 8% of the mean of the habitat targeted for reservation included in the reserve system in north-east NSW, with 6 populations achieving less than 10% of their reservation targets (see Table).

HASTINGS RIVER MOUSE RESERVE STATUS IN NORTH EAST NSW AS AT 2004 (From Flint *et. al.* 2004)

	Population Targeted for Reservation	Estimated Total Population Reserved	Percentage of Reserve Target Achieved
Hastings River Mouse - pop.1	4238	3	1%
Hastings River Mouse - pop.2	4251	116	3%
Hastings River Mouse - pop.3	4251	322	8%
Hastings River Mouse - pop.4	4251	47	1%
Hastings River Mouse - pop.5	4238	523	12%
Hastings River Mouse - pop.6	4238	1231	29%
Hastings River Mouse - pop.7	4251	287	7%
Hastings River Mouse - pop.8	4251	334	8%
	33969	**2863**	**8%**

The Hastings River Mouse has already been identified as having a high likelihood of becoming extinct within the next 50 years. The extremely low level of reservation achieved has guaranteed that this will be the case unless strong and effective management is applied off-reserve.

As in the May 1998 and November 2002 Drafts, the final 2005 Recovery Plan for the Hastings River Mouse includes as a Management Guideline (Appendix 3):

Timber Harvesting

Surveys: Pre-logging habitat and population surveys (Appendixes 1 & 2) should be carried out by the relevant agencies in areas not covered by the Integrated Forestry Operations Approvals for the Upper North East and Lower North East Regions.

Timber Harvesting: Timber harvesting and associated activities should be excluded from areas of medium to high quality Hastings River Mouse habitat.

Within a 200 m buffer around medium to high quality Hastings River Mouse habitat and mapped Hastings River Mouse corridors the following should apply:

- *if the area is unlogged or has not been logged since 1950 it will remain unlogged;*

- *in other areas a minimum of six mature trees with basal hollows, or trees likely to develop basal hollows, per hectare will be retained;*
- *all burning will be excluded; and*
- *no fire wood collection should occur within 200 m of a known Hastings River Mouse population.*

For public lands the Threatened Species Licence gives forests NSW the choice of establishing *"An exclusion zone, or exclusion zones, ... to protect all modelled habitat within the compartment*" or undertaking specified habitat assessments to identify habitat of moderate or high suitability within which targeted trapping surveys are required (TSL 8.8.9).. The Threatened Species Licence (TSL 6.13) requires that exclusion zones of 200 metres must be established around records of Hastings River Mouse, extending to 800m in Hastings River Mouse habitat assessed as of moderate or high suitability. So the requirement is to only protect part of the medium and high quality habitat if they happen to catch a Hasting River Mouse, with no application of a 200m buffer to that habitat. This is a major reduction on what the Recovery Plan identifies as a Management Guideline for logging.

Even the weakened TSL prescription is often ignored, For example, in three separate forests Sparkes (2010) identified a total of 83 hectares of modelled habitat of the Hastings River Mouse that was logged without the required habitat or trapping surveys having been undertaken to justify not excluding the areas from logging. Because the required surveys were not done it is not known what effect this had on Hastings River Mouse. In a typically grossly inadequate response, the EPA (then DECCW) issued warning letters for two of these three breaches.

The Threatened Species Licence was amended in 2007 and more recently in 2010 so as allow logging operations within 31 compartments in 6 State Forests to be undertaken within areas that would otherwise be required to be protected (TSL 6.13B). These included Mount Mitchell State Forest Compartments 16, 17 and 18. This over-rides TSL 6.13 by establishing a mapped HRM exclusion zone and HRM operational zones, with snigging and roading allowed in the operational zones. It is a safe bet that this major wind-back in protection for the Hastings River Mouse has never been subject to auditing to assess impacts.

What is most alarming is that this reduced protection appears to have been approved because of the high numbers of Hastings River Mice in these areas. Such areas should be designated critical habitat and fully protected (particularly given the poor reservation status of this species) rather than being allowed to be logged with reduced protection.

For example, there were 16 records of Hastings River Mouse made in compartment 16 of Mount Mitchell SF, indicating a much larger population inhabiting the area and one likely to be of national significance. A site inspection of FNSW operations in Compartments 16, 17 and18 of Mount Mitchell State Forest in September 2011 by Joe Sparkes found breaches that directly affected the habitat utilised by Hastings River Mouse. He identified numerous breaches of erosion mitigation conditions, including 4 stream crossings in an identified exclusion zone for a Stuttering Frog which appears to overlie a Hastings River Mouse Exclusion Zone. He states (pers comm.):

> *We have today found serious breaches of the Environment Protection Licence in cpt's 16, 17, 18. Four crossings of Hartleys creek (4th order stream) are unstable crossing's in breach of the EPL, sediment pollution is resulting from all four instances, one crossing is two concrete pipes which have been crushed by the machinery, it seem in a deliberate act. This same crossing has 50m of road drainage draining directly in to it (the EPL specifies 30m). 25m east of crossing 4, there is 150m of undrained road at 18 degrees leading in to the*

exclusion zone, 3 of the crossings are within a stuttering frog exclusion zone. One is right on the records for these frogs and could represent an attempt to kill these animals.

PHOTO: ONE OF 4 BREACHES OF RIPARIAN ZONE IN MOUNT MITCHEL SF.

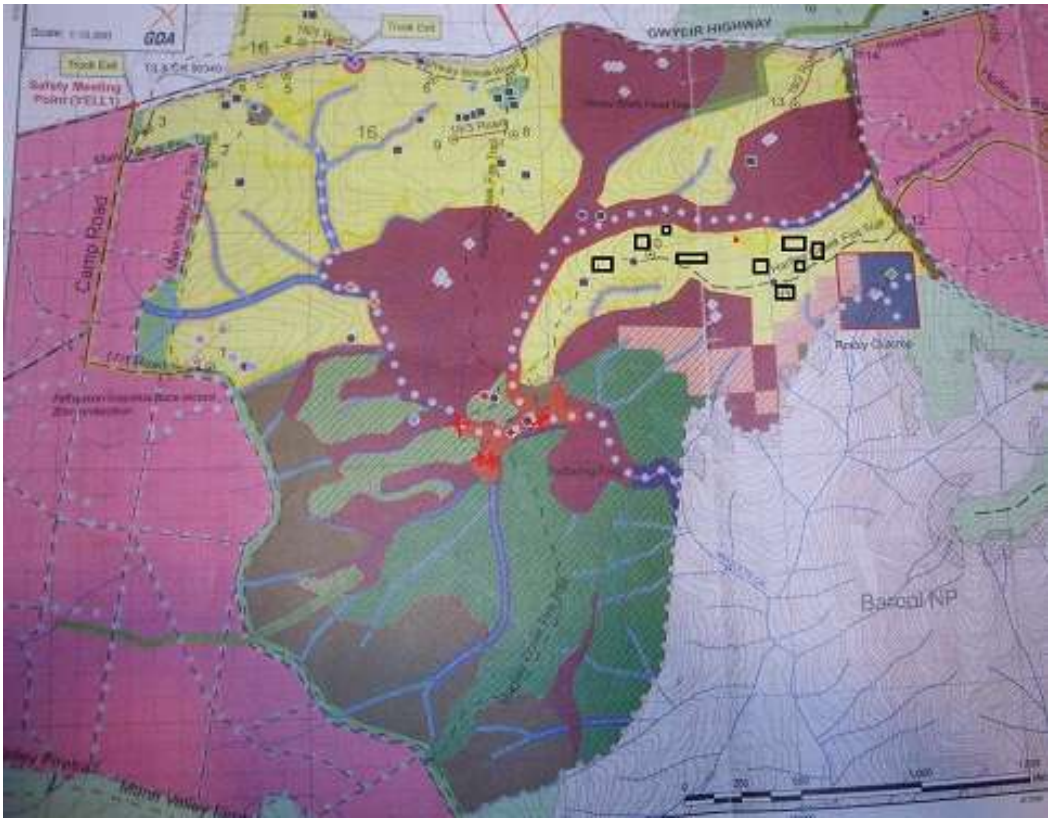


PHOTO: HARVESTING PLAN FOR COMPARTMENT 16 SHOWING HRM EXCLUSION ZONE (MAROON), HRM RECORDS (GREY DIAMONDS), STUTTERING FROG EXCLUSION ZONE (RED), AND REPORTED BREACHES (RED CROSSES)

In response to Mr. Sparkes' complaint the EPA responded (G. Abood, 12 February 2012):

> *... the EPA immediately responded to your report of water pollution by issuing Forests NSW a Clean-Up Notice ... Forests NSW complied with this notice and implemented temporary sediment control measures on 30 September 2011 at each of the crossings within Mt. Mitchell State Forest.*
>
> *In relation to your environment line report, the EPA has determined that Forests NSW failed to comply with the Environment Protection Licence (EPL) best practice conditions on 24 occasions, specifically failing to undertake operational planning for the four crossings. The EPA has issued Forests NSW with a formal written warning relating to Forests NSW failure to undertake the appropriate operational planning.*

The issuing of a warning letter for so many breaches is a grossly inadequate response. True to form the EPA made no attempt to assess impacts on the riparian habitat of Stuttering Frog or Hastings River Mouse.

The Recovery Plan (DECCW 2005) identified that 4.3% of NSW's total Hasting River Mice capture sites are from freehold land (which is quite high considering the limited surveys undertaken on freehold tenures). There are likely to be significant populations on freehold land as 21% of high quality habitat is modelled on freehold land. The prescription applied to forestry operations on freehold land are a sham. Contrary to the Recovery Plan, the Private Native Forestry Code of Practice for Northern NSW ignores modelled habitat for this species and requires that a 200m exclusion area must be established around any known records. Because there are no requirements for surveys to locate this species (even in modelled habitat), and it is unlikely they will have been previously recorded on most private property sites where it occurs, this prescription will have absolutely no effect on most logging operations undertaken within occupied Hastings River Mouse habitat on private land.

The Inquiry needs to recognise that there is no monitoring of prescriptions applied to supposedly reduce logging impacts on threatened species, and thus no adaptive management. The Inquiry should recommend a monitoring program to assess the impacts of forestry operations on nationally threatened species so as to objectively assess the effectiveness of logging prescriptions intended to mitigate impacts, and identify appropriate improvements.

In light of the inadequate protection applied for the endangered Hastings River Mouse on public land, and the lack of any meaningful protection on private land, it is requested that the Inquiry recommend that, in accordance with the Hastings River Mouse Recovery Plan, logging be prohibited within medium and high quality Hastings River Mouse habitat across all tenures, and be appropriately modified within 200m of such habitat. No further reductions to protections for Hastings River Mouse should be allowed unless part of a justifiable scientific trial overseen by independent experts.

3.1. IGNORING THREATENED PLANTS

Across all land tenures the basic approach to the numerous threatened plant species in forestry operations is to require exclusions around many species, though to not undertake competent surveys to find them. The result is that threatened plants are mostly ignored in logging operations unless they have been previously recorded.

In Wedding Bells SF (Pugh 2011b) NEFA found numerous Rusty Plums that had been cut down, had trees dropped on them, or been bulldozed. Forests NSW were still logging habitat of the threatened plants Rusty Plum *Amorphospermum whitei* , now called *Niemeyera whiteii*, and Milky Silkpod *Parsonsia dorrigoensis* under a 2000 prescription for these species that were effectively meant to be 2 year monitoring programs. They clearly state that logging where these species occur is expected to kill a number of individuals and that therefore monitoring will be undertaken for 2 years to ascertain the numbers killed and their regeneration ability. It states that results are required to be reviewed after 2 years at which time a new prescription was meant to be applied. While Forests NSW were still logging under this two-year monitoring program they did not submit their first monitoring report on Rusty Plum to the EPA until 2008 and on Milky Silkpod until 2009. The EPA (2012) were not happy that the monitoring was of representative operations and for both species *"is currently reviewing the results ... with the objective to negotiate for either further monitoring or prescribed conditions during harvesting or other relevant action"*.

It is shameful that logging is still occurring 10 years after the two year monitoring plan was meant to have been completed and a final prescription adopted. This is "scientific logging" – logging under a monitoring program that is still incomplete and a prescription that has never been reviewed. This is what the agencies term "adaptive management".

It is not believed that any of the flora or fauna prescriptions have been subject to monitoring to assess their effectiveness. Though without having a clear idea of what they are meant to achieve there is nothing to monitor their performance against.

Forests NSW's Threatened Species Licence (5.2.1b) requires them to identify and appropriately protect locations around an array of threatened plant species. Except where there are pre-existing records, protection depends upon threatened species being searched for and located at the time of compartment mark-up.

In a single inspection of Doubleduke SF a botanist employed by the North Coast Environment Council (see Benwell 2010, Pugh 2010b) found *"The endangered species Lindsaea incisa (a small ground fern) was identified at a site that appeared to be within the harvestable area of cpt 145"* and in compartment 144 he found the threatened grass *Paspalidium grandispiculatum "amongst earth on an upturned stump at the edge of the recently constructed or upgraded access track, so would appear to have been directly damaged during track construction".*

NEFA subsequently found large numbers of *Lindsaea incisa* (within a wetland and its buffer that had been illegally logged) in Doubleduke SF from within which trees had been logged and machinery driven through it, despite the requirement being for a 50m exclusion zone to be established. Despite it being blatantly obvious that logging and roading had occurred well within what was legally required to be a 50m buffer around *Lindsaea incisa,* the EPA refused to take any regulatory action or require rehabilitation.

In Doubleduke, Benwell (2010) considered "*No pre-logging flora surveys or flora assessments that could have detected this species appear to have been carried out by FNSW".* After roading and logging resumed in compartment 144 NEFA was informed that a foreman had been trained (by showing him a picture) to identify the cryptic *Paspalidium grandispiculatum.* It is evident that most foresters do not have the required skills to identify most threatened plants.

In Styx River SF (Pugh 2012c) NEFA identified to the NSW Government that no suitably qualified person had apparently undertaken surveys for the nationally vulnerable Fragrant Pepperbush *Tasmannia glaucifolia* (breaches TSL clause 5.2.1(a)), despite there being a record within the compartment, or made any attempt to delineate any required 50m buffer zones (breaches TSL clause 6.22). Potential habitat for this species had apparently been subject to roading, burning and logging without any meaningful attempt to locate or protect the species.

The prescriptions for threatened plants applied to forestry operations on private land are a sham. The Private Native Forestry Code of Practice for Northern NSW requires that various exclusion areas of 20-50m must be established "where there is a record of a species", or for some species that a proportion of the population should be protected or that damage should be avoided. Because there are no requirements for surveys to locate any threatened plant species, and it is unlikely they will have been previously recorded on most private property sites where they occur, this prescription will have absolutely no effect on most logging operations undertaken within habitat of nationally threatened plant species.

The Inquiry needs to recognise that while there are theoretical prescriptions for most threatened plants, they are rarely applied because appropriately experienced botanists are not searching for them ahead of logging. It is suggested that the Inquiry recommend that pre-logging surveys for threatened plants be undertaken by appropriately experienced botanists on all land tenures.

3.2. THREATENING THREATENED FISH.

Under the Fisheries Licence the presence of threatened fish downstream of a logging operation should trigger an Aquatic Habitat Assessment and protection of unmapped drainage lines.

The Fisheries Licence is "*Terms of Licence under section 220ZW of the Fisheries Management Act, 1994 to harm threatened fish species during undertaking of forestry related activities. Upper North East Region".* As Fisheries NSW and Forests NSW are both in the Department of Industry and Investments there is a strong reluctance by Fisheries to regulate or penalise their colleagues, as evidenced by just one FL audit/complaint being dealt with in the UNE over the 10 years 1999/2009, and no enforcement action being taken. Our recent audits prove that the FL is being regularly breached, the problem is that until recently there was no enforcement.

The Fisheries Licence didn't come into its own until over 90% of forestry operations were effectively exempted from the need to comply with Environmental Protection Licences (EPLs) in 2004. While the Threatened Species Licence still provided some protection for streams, the Fisheries Licence became the principal regulatory instrument to control stream pollution in most logging operations, most particularly as it still requires protection of "unmapped" streams (i.e. not shown on 1:25,000 topo maps) upstream from threatened fish.

The Licence establishes two critical questions for forestry operations:

1. Does Class 1 or Class 2 habitat occur in the area being proposed for logging?
2. Is a Pre-Logging and Pre-Roading Aquatic Habitat Assessment required to be prepared?

Condition 7 of the Fisheries Licence states:

> ***Class 2 aquatic habitat*** is defined as that part of a watercourse, wetland or other water body ... where the pre-logging and pre-roading assessment has determined that potential habitat of threatened species does occur within 100km downstream of the site of the proposed works, provided that the threatened species in question is likely to permanently, periodically or occasionally be present in fresh or estuarine waters.

The Fisheries Licence requires in Section 9 for Forests NSW to prepare "Pre-Logging and Pre-Roading Aquatic Habitat Assessments" (AHAs):

> *9.1 General Requirements*
> *a) Specified forestry activities must not be undertaken in any compartment unless a pre-logging and pre-roading aquatic habitat assessment has been conducted. This condition applies to all harvest operation planning not yet commenced.*

Section 9.2 "Desktop Review of Proposed Operation(s)" of the Fisheries Licence requires a variety of assessments, including *"a database search for threatened fish records"*, that for each record *"species name (both common and scientific), location (AMG), date of record, type of record (e.g. observed, trapped), observer's name, and source of record"*, and "*Maps of potential habitat of those species requiring consideration"*.

Forestry NSW seems to have used contorted logic to limit the preparation of AHAs and the identification of Class 1 and 2 habitats to where crossings of mapped streams are proposed. Their planning "Checklist to Ensure Fisheries Licence Requirements Met" only triggers the need for AHA and the identification of Class 1 and 2 habitat where "*'in stream works' consisting of*

new/replacement or significant upgrade proposed". If such works are not proposed the checklist states *"no further assessment required*".

Another problem is that Forests NSW interprets the Fisheries Licence to mean that they do not have to take specified actions to protect threatened fish species unless the data is first provided to them by Fisheries NSW.

The Oxleyan Pygmy Perch is identified as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the NSW *Fisheries Management Act 1994*. Actual and Potential habitat for this species has been identified downstream of a number of logging operations inspected by NEFA. Threats to this species include runoff and sediment from stream crossings, logging operations and post-logging burns.

When NEFA complained about the failure of Forests NSW at Doubleduke to consider information presented in the 2005 Recovery Plan for the nationally endangered Oxleyan Pygmy Perch (Pugh 2010c) we were told (J. Murray pers. com., November 2010) that they didn't need to consider the species because Fisheries NSW had not provided them with the required information. Oxleyan Pygmy Perch had been listed as endangered before the Fisheries Licence came into effect in 1998. So, at that time, Forests NSW had never taken any mitigation action specifically for this endangered fish for 12 years on the grounds that nobody had provided them with the publicly available recovery plan or publicly available data. It is revealing that Fisheries NSW were going to give them the data 5 years before, but hadn't got around to it, as stated in the 2004/5 RFA report:

> *Preparation of distribution data for the Oxleyan pygmy perch (Nannoperca oxleyana), a species occurring in coastal areas of northern New South Wales, and Macquarie perch (Macquaria australasica) occurring in streams of the southern highlands and slopes, is complete. Both species could be affected by forestry operations and the distribution data is expected to be provided to Forests NSW shortly*

In response to our request for any AHAs for compartments 144 and 145 in Doubleduke SF (Pugh 2010c) NEFA was provided with the document *"Assessment of Proposal for In-stream Works in Aquatic Habitats"* (1/7/2009) which only applied to compartment 144 where instream works were proposed. Forests NSW did undertake unapproved works in a stream and wetland in compartment 145 though neither EPA nor Fisheries NSW bothered to undertake any regulatory action. Aside from being undertaken by a forester without the required experience and failing to satisfy legal requirements, the pseudo "AHA" undertaken failed to recognise the existence of Oxleyan Pygmy Perch despite the 2005 Recovery Plan identifying that this compartment occurs within the identified *"likely natural distribution"* of the Oxleyan Pygmy Perch and the existence of numerous records downstream. It is also revealing that Fisheries NSW approved the Doubleduke "AHA" without themselves identifying the missing endangered species.

Despite NEFA discussing our concerns with both Fisheries NSW and Forests NSW, and submitting a written complaint, Fisheries NSW refused to take any legal action against Forests NSW – not even a warning letter. In November 2011, when complaining about Doubleduke, NEFA was verbally assured by Fisheries NSW that the problem had been fixed by provision of the required data to Forests NSW and would not occur again.

It is extremely concerning that shortly after our complaints over Doubleduke SF Forests NSW did another shoddy checklist for Wedding Bells SF, again failed to prepare an Aquatic Habitat Assessment and again ignored the presence of Oxleyan Pygmy Perch downstream (Pugh 2011c)..

This time Forests NSW's assessment for threatened fish comprised "Schedule 5 – Checklist to ensure Fisheries Licence Requirements Met" prepared by Forests NSW's Harvest Planner. It concluded:

> *The results of the desk top review resolved that there were no species listed under Schedule 4 or 5 of the Fisheries Management Act 1994 in the relevant planning area. No known or potential habitat was identified in the area as determined in accordance with clause 9.2 or 9.3 of the Threatened Fish Licence.*

Attached to the checklist are records for Eastern Cod and Oxleyan Pygmy Perch from Fisheries NSW's website (which are limited to Fisheries own limited records) and a copy of the relevant sheet of Fisheries' "Oxleyan Pygmy Perch Critical Habitat" from NSW Department of Primary Industries (2010). Given that the DPI (2010) report identifies an Oxleyan Pygmy Perch record from near Corindi (downstream of the logging) and that "critical habitat" occurs downstream on the Corindi River it is surprising that the checklist did not pick this up. It is revealing that since at least 2004 the Roads and Traffic Authority has been acknowledging the potential habitat of the Oxleyan Pygmy Perch in Wedding Bells State Forest in its planning processes and a variety of reports.

The Harvesting Plans for the Wedding Bells compartments wrongly claim that *"Conditions of the Fisheries Licence do not apply in these compartments"* and that *"Unmapped drainage line harvesting is permitted in accordance with Best Management Practise"* (Pugh 2011c). Given the actual, potential and critical habitat of Oxleyan Pygmy Perch downstream, Forests NSW should have prepared an AHA and should have excluded logging from unmapped drainage lines. Despite a Fisheries NSW audit confirming numerous instances of logging of unmapped drainage lines, they once again refused to take any regulatory action on the grounds that they hadn't provided the required data to Forests NSW.

Once again in Royal Camp SF a NEFA audit (Pugh 2012e), not far from Doubleduke, found that the presence of Oxleyan Pygmy Perch downstream had been ignored in the preparation of an AHA. This time an AHA had been prepared as the intent was to construct one creek crossing within mapped potential habitat of the Eastern Freshwater Cod, with two other crossings to be constructed not far upstream (instream works). The Harvesting Plan for compartment 16 states:

> *The results of the desk top review resolved that within 2km upstream or 100km downstream of the relevant planning area known habitat or potential habitat occurs. However, field assessment has identified that suitable Eastern Freshwater Cod habitat <u>does not</u> occur within 5km of the harvest area. Wetlands and other water bodies within this compartment comprise Class 2 aquatic habitat as defined in condition 7 of the Fisheries Licence*

It is amazing that the Forester was able to ascertain this given that no assessment was undertaken within 5km of any of the crossings. The single "AHA site" was located at a bridge crossing on a separate stream in cleared farming land some 9 km from where the stream crossings were proposed. The "assessment" was a partially (environmental data is omitted) and wrongly (ticks are used rather than a 4 level grading) completed simplistic proforma that states *"Note: Creek substrate not suitable for EFC habitat" (see below)*. No useful or meaningful information is provided.

Site specific work should have been undertaken given that potential habitat for Eastern Freshwater Cod has been identified where one of the crossings was to be created and not far downstream of the other two. The Fisheries Licence 9.3(a) clearly states:

*Pre-logging/pre-roading aquatic habitat assessments **must be conducted in the vicinity** of any location where specified forestry activities are to be conducted within an exclusion zone that is known or potential habitat of species listed in schedules 4 or 5 of the FM Act.*

EXAMPLE OF AQUATIC HABITAT ASSESSMENT OF MAPPED POTENTIAL HABITAT OF THE EASTERN FRESHWATER COD AT ROYAL CAMP SF.

Pre-Logging and Pre-Roading Aquatic Habitat Assessment (Part 1)

prepared in accordance with Condition 9 of the Fisheries Licence

Management Area: Casino State Forest: Royal Camp Compartment: 16

Harvest Plan No: 3857

1. Summary of records located during database searches. (Dated printout of search attached)

2. Sites inspected in accordance with 9.4 of the Fisheries Licence are shown on the attached map and results of the field inspection are recorded on the attached pro-forma(s).

Statement in accordance with 9.4 b iii) of the FL –
Ways in which the assessor meet the experience criteria in 9.5 of the FL.
Dan Allen: Holds a B App SC (Forestry) 2005

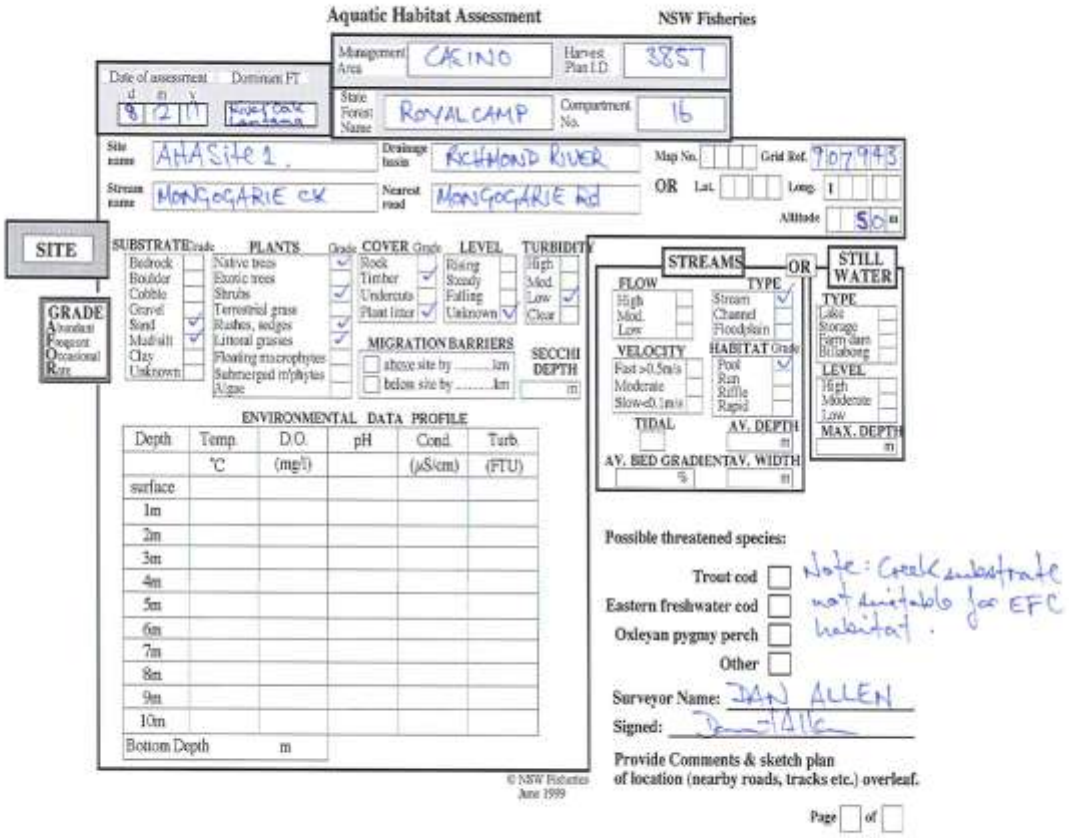
7 Years as a practicing professional Forester, 6 years with Forests NSW

3 years working with Fisheries Licence Conditions, reviewing and classifying aquatic habitat.

3. The results of the desk top review resolved that within 2km upstream or 100km downstream of the relevant planning area known habitat or potential habitat occurs. However, field assessment has identified that suitable Eastern Freshwater Cod habitat does not occur within 5km of the harvest area. Wetlands and other water bodies within this compartment comprise Class 2 aquatic habitat as defined in condition 7 of the Fisheries Licence.

Prepared by

Harvest Planner		Date:



Aquatic Habitat Assessment

NSW Fisheries

Management Area: CAENO

Harvest Plan I.D.: 3857

Date of assessment: 9/12/11

Dominant FT: Rainforest

State Forest Name: ROYAL CAMP

Compartment No.: 16

Site name: AHA Site 1

Drainage basin: RICHMOND RIVER

Map No.:

Grid Ref.: 707973

Stream name: MONGOGARIE CK

Nearest road: MONGOGARIE Rd

OR Lat.: Long.:

Altitude: 50 m

SITE

GRADE (Abundant, Frequent, Occasional, Rare)

SUBSTRATE (Grade): Bedrock, Boulder, Cobble, Gravel, Sand, Mud/silt, Clay, Unknown

PLANTS (Grade): Native trees, Exotic trees, Shrubs, Terrestrial grass, Rushes, sedges, Littoral grasses, Floating macrophytes, Submerged m'phytes, Algae

COVER (Grade): Rock, Timber, Undercuts, Plant litter

LEVEL: Rising, Steady, Falling, Unknown

TURBIDITY: High, Mod., Low, Clear

MIGRATION BARRIERS: above site by ..... km; below site by ..... km

SECCHI DEPTH: m

STREAMS OR STILL WATER

FLOW: High, Mod., Low

TYPE: Stream, Channel, Floodplain

VELOCITY: Fast >0.5m/s, Moderate, Slow<0.1m/s

HABITAT (Grade): Pool, Run, Riffle, Rapid

TIDAL

AV. DEPTH: m

AV. BED GRADIENT: %

AV. WIDTH: m

STILL WATER TYPE: Lake, Storage, Farm dam, Billabong

LEVEL: High, Moderate, Low

MAX. DEPTH: m

ENVIRONMENTAL DATA PROFILE

Depth	Temp.	D.O.	pH	Cond.	Turb.
	°C	(mg/l)		(µS/cm)	(FTU)
surface					
1m					
2m					
3m					
4m					
5m					
6m					
7m					
8m					
9m					
10m					
Bottom Depth	m				

Possible threatened species:

Trout cod

Eastern freshwater cod

Oxleyan pygmy perch

Other

Note: Creek substrate not suitable for EFC habitat.

Surveyor Name: JAN ALLEN

Signed:

Provide Comments & sketch plan of location (nearby roads, tracks etc.) overleaf.

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© NSW Fisheries June 1999

Both Forests NSW and Fisheries NSW have displayed an appalling contempt for threatened fish in NSW.

The Private Native Forestry Code of Practice for Northern NSW ignores threatened fish and does not require the protection of unmapped drainage lines

The Inquiry needs to recognise that the NSW Fisheries Licence has failed for the past 14 years to provide the intended protection for most threatened fish because Forests NSW do not consider they are required to consider any species unless detailed distribution data is first provided by Fisheries NSW. Requirements for data collation and habitat assessment are treated with contempt. The limited prescriptions required to be applied upstream of threatened fish are often ignored. Threatened fish are ignored in forestry operations on private lands. The Inquiry needs to engage independent experts to identify meaningful prescriptions to be applied for threatened fish.

4. MITIGATING FERAL ANIMAL IMPACTS

There are limited programs and funding for the control of feral animals on public lands. The undertaking of a planned approach to feral animal control is mandated by the NE Regional Forest Agreement. In accordance with this, previous NSW Governments have undergone lengthy processes to co-ordinate their feral animal control programmes that is reflected in statutory Management Plans for parks, threatened species recovery plans and threat abatement plans. This has involved public consultation over a large variety of documents.

The NSW Government is currently cutting back OEH resources and staffing at the same time it is introducing recreational shooting into national parks. This political opportunism will limit and divert resources for systematic feral animal control programs and thereby increase their impacts on threatened fauna.

The Game and Feral Animal Control Amendment Act 2012 allows amateur shooting in all national parks, except for 48 listed parks and reserves around Sydney, and those parts of parks that are declared wildernesses or declared world heritage. This makes 94% of NSW's 799 national parks, nature reserves, and state conservation areas potentially available for shooting. It will be up to the Environment Minister to agree to whichever ones the Shooters want. A shortlist of 79 parks has been put forward by the shooters for initial approval. The shooter's priorities do not reflect feral animal control priorities or needs.

The NSW Government's belated attempts to maintain the pretence that this *"program is not about recreational hunting, it is a volunteer program with licensed and trained shooters assisting us with our pest management activities"* has been made untenable by the Public Service Association of NSW's direction to its members *"not to assist with any activity involved with establishing recreational hunting in national parks in NSW"*. This only leaves the discredited Game Council to oversee the shooters.

Most of the national parks in NSW are "Schedule 2" lands and thus have a general destruction obligation for wild dogs. The Pest Control Order for Wild Dogs allows this obligation to be satisfied through the preparation of a wild dog management plan with both control and conservation objectives.

The general intent of OEH is to meet the conservation needs for dingoes by providing refuges in the core of their reserves and focussing wild dog control activities on their boundaries. Apparent problem areas for wild dogs are first assessed by use of sand plots to determine wild dog activity before determining the most appropriate control methods. OEH work with the Rural Lands Protection Boards to develop an agreed and planned approach to wild dog control.

For example, in the Northern Rivers Region, for Schedule 2 areas, such as the Richmond Range, Yabbra and Nightcap National Parks, the Regional Wild Dog Management Plan for the North Coast Livestock Health and Pest Authority Area requires the development of local operational plans for local wild dog management with representatives of all stakeholder groups. The Rural Lands Protection Board's *Wild Dog Management Plans* are an outcome of this process and identify the control methods for these parks as 1080 baiting, when required, not shooting. Plans such as the *Parks & Reserves of the Tweed Caldera Plan of Management* and the Border Ranges Rainforest Biodiversity Management Plan (which constitutes a recovery plan for multiple species) endorse and rely upon the agreed RLPB plans.

The Federal Government's Threat Abatement Plan for predation by the European red fox identifies the need for a systematic approach to identify priority areas for fox control activities. OEH's Threat Abatement Plan for Predation by the Red Fox has implemented the prioritisation process for fox control and identified high and medium priority national parks. Of all the areas that are identified as

priorities for recreational shooting, only Barrington Tops is identified as a high or medium priority area.

For example, in the Northern Rivers Region a number of coastal parks are identified as priorities for fox control, while the shooter's priorities of Richmond Range, Yabbra and Nightcap are identified as requiring further assessment. It would be a shame to now over-ride the Commonwealth's prioritisation process and divert OEH's scant resources away from applying systematic control methods in identified priority areas into being safari guides for shooters.

The Commonwealth's fox Threat Abatement Plan notes that "*Although ground shooting of foxes may reduce local numbers or problem animals, it is labour intensive and is not effective as a broadscale fox control method."*

Similarly the Commonwealth's feral pig Threat Abatement Plan notes that *"However, except in special circumstances, ground shooting is not considered to be an effective technique for control of feral pigs because it is labour intensive and can be used only to target small groups of pigs. Shooting, especially where dogs are used, can be counterproductive to other techniques in that it can disperse pigs or make them more wary."*

As with foxes, there are identified priority areas for feral pig control that may not be reflected in the Shooters list. For example, in the Northern Rivers Region there are some significant problem areas, though Richmond Range, Yabbra and Nightcap do not have pig problems.

There are many identified threatened plants that may be directly affected by trampling, fires or pathogens and weeds introduced on boots or clothes of hunters.

While all animals are vulnerable to deliberate or accidental shooting, many are also susceptible to the disturbances associated with hunting through their habitat. Ground birds such as Albert's Lyrebird, Rufous Scrub-bird, Eastern Bristlebird, and Black-breasted Button Quail (all identified world heritage values) would be amongst the most vulnerable, particularly when nesting. For example the Eastern Bristlebird is particularly sensitive to people wandering around its territories and will desert a nest after only a slight disturbance and vacate a territory if it is systematically searched.

Recreational hunters have been responsible for the spread of feral animals across the landscape, releasing feral animals in new areas, particularly pigs and deer, to create future hunting opportunities closer to home. Their ethos is not to eliminate feral animals, but rather to encourage their favourite game species.

The over-riding of years of planning for political opportunism should not be accepted by the Commonwealth. Recreational hunting is neither an effective nor efficient way to control feral animals. The NSW Government is currently cutting OEH staff and has made it clear that they will not allocate additional resources to manage recreational shooting. The diversion of limited OEH resources away from priority feral control areas and into organising ad hoc safaris for recreational shooters will be detrimental to efficient feral animal control and thus threatened species management. It will divert scant resources from where they are needed most, and is thus likely to result in reduced control of the worst feral animal threats to threatened fauna species.

The Inquiry should condemn the opening up of national parks in NSW for recreational shooting as this will increase the direct threat to a number of threatened species and divert limited resources and staff from systematic and prioritorised feral animal control programs and thereby increase the impacts of feral animals on threatened fauna.

5. MITIGATING WEED IMPACTS

The highest numbers of alien species are in NSW, particularly on the north coast, where some 980 'naturalised' species now comprise 16% of NSW's flora *(A.N.P.W.S. 1991*). Disturbances such as logging, burning, roading and the like favour the establishment of weeds *(Amor and Piggin 1977, Browning 1977, Smith and Waterhouse 1988, Tegart, Sheldon and Griffiths 1990).* The frequency and nature of disturbances associated with logging is resulting in the increasing dominance of weed species in many areas.

In north east NSW lantana is the most significant invasive weed of disturbed native forests. In deciding to list the Invasion, establishment and spread of Lantana (*Lantana camara* L. *sens. lat*) as a key threatening process, the NSW Scientific Committee note:

> *9. L. camara readily invades disturbed sites and communities. Various types of sclerophyll woodlands, sclerophyll forests, rainforests and dry rainforests are all susceptible to Lantana establishment ... There is a strong correlation between Lantana establishment and disturbance (Stock and Wild 2002; Stock 2004), with critical factors being disturbance-mediated increases in light and available soil nutrients (Gentle and Duggin 1998) and, in rainforest, the competitive advantage of seedlings relative to many native species (Stock 2004). ...*
>
> *...*
>
> *16. The generally suppressive effect of Lantana on a wide range of native species is attested by several studies (Gentle and Duggin 1998, Day et al. 2003) and a multitude of field observations. Swarbrick et al. (1995), citing observations by Driscoll and Quinlan (1985) that "eucalypt seedlings generally fail to establish under lantana", infer inhibition of germination through lack of light. ....*
>
> *...*
>
> *22. L. camara is "regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts" (CRC Weed Management 2003). It is one of the initial 20 Weeds of National Significance declared under the National Weeds Strategy, and a national Lantana Strategic Plan has been adopted (ARMCANZ ANZECC&FM 2001). ...*

The Scientific Committee identify Lantana as a threat to 83 endangered and vulnerable plant species, 2 endangered animals and 15 Endangered Ecological Communities. The repeated disturbances associated with logging are facilitating the increasing dominance of vast swathes of north-east NSW's forests by this weed. Despite the evident and growing problems, this weed is effectively ignored by Forests NSW in their planning processes. The thick "impenetrable" understorey caused by lantana is now the primary excuse used by Forests NSW for not undertaking the mark up surveys necessary to implement prescriptions for threatened plants and a variety of fauna (see sub-section on Koala). Aside for being a convenient excuse, Forests NSW's harvesting plans (inspected by NEFA) make no attempt to identify the extent and severity of the problem and do not propose any control mechanisms. Rather, Forests NSW simply log such areas again and exasperate the problem. The fact that it is a Key Threatening Process is ignored.

The most obvious example of forest ecosystem collapse in NSW is Bell Miner Associated Dieback. This is most often the result of:

1. Opening of the overstorey by logging, ground disturbance by machinery and removal of competition by post-logging burning allowing lantana to dominate the understorey,

2. The open overstorey and dense lantana understorey allowing Bell Miner colonies to dominate the altered habitat and aggressively exclude most other birds, and
3. The reduction in predators allowing sap-sucking psyllids to proliferate on the remaining eucalypts, causing their decline and death.

Bell Miner Associated Dieback (BMAD) is recognised as a significant problem and growing threat to thousands of hectares of forests in north east NSW. The NSW Scientific Committee (2008) listed 'Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners' as a Key Threatening Process. Both Forests NSW and the EPA appear disinterested in the problems caused by BMAD and Lantana invasion, the need to avoid logging operations in affected stands and the need for active rehabilitation of degraded areas.

The Bell Miner Associated Dieback Working Group (BMADWG 2004) summarise the problem:

Bell miners are a natural part of eucalypt ecosystems and normally have minor and positive impacts on forests. However, increases in Bell miner populations and their distribution, in addition to other factors such as tree stress, psyllid infestation, dense forest understories as well as weed invasion, drought, logging, road construction, pasture improvement, bio-diversity loss both floral and faunal, soil nutrient changes, and changing fire and grazing regimes have all been implicated in the spread of dieback. The outward expression of BMAD is generally characterised by:

- *trees stressed and dying;*
- *high populations of psyllids and other sap-sucking insects contributing to tree stress;*
- *high Bell miner numbers, with their aggressive territorial behaviour, driving away insectivorous birds that would otherwise help to control insect numbers;*
- *alteration of the forest structure: canopy and midstories depleted with grassy and wet and dry sclerophyll understoreys replaced by dense shrubby vegetation, often associated with lantana invasion*

The Bell Miner Associated Dieback Working Group (BMADWG 2004) summarise the consequences:

The potential impacts of BMAD on forest productivity and biodiversity cannot be overstated.

Potential impacts for conservation include:

- *Extreme degradation of forest ecosystems in World Heritage listed National Parks such as Border Ranges NP, Murray Scrub and Dome Mountain in Toonumbar NP, Bungdoozle and Cambridge Plateau in Richmond Range NP, Mt Nothofagus NP, Kooreelah NP, and Mt Clunie NP.*
- *Major disruption in ecosystem function, and reduction in diversity and abundance of threatened flora and fauna species including Dunn's White Gum (Eucalyptus dunni) and Rufous Bettong (Aepyprymnus rufescens) across all land tenures,*
- *Increased weed invasion and associated displacement of native forest species.*

Impacts on forest productivity can be severe. Dieback defoliates the crown, ultimately leading to the death of standing trees. Not only do the standing trees die, but the lack of foliage and flowering and subsequent fruiting, reduce and eventually eliminate the seed production necessary for forest regeneration. Dense understorey development (primarily Lantana weed invasion in northern NSW and Cissus in the south) continues with little overstorey and reduced alternative species competition. Reduced eucalypt flowering directly impacts on honey production and on bird species and populations that compete with Bell miners.

> *Impacts of BMAD on private lands are significant, as these areas are critical to the livelihoods and well being of local communities. Forest woodlots and timber supplies, honey production, shelter belts and forest-related lifestyles are under threat from BMAD.*
>
> *Local economies may also be impacted through declining forest tourism as dieback reduces the value, significance and aesthetic appeal of the forests.*

State Forests recognised dieback associated with psyllids as a significant problem in the Gosford-Wyong area of north-east NSW in 1950 (Moore 1959). Stands of Sydney Blue Gum were reported as dying during the period 1949 to 1958, *"the increasing numbers of deaths reaching economic significance toward the end of that period"* (Moore 1959). The two areas assessed by Moore showed 55% and 59% of trees as dead or expected to die. Moore (1959) hypothesised that *"the abnormal rainfall adversely affected the physiology of* Eucalyptus *and other species generally, making them susceptible to heavy attack by psyllids*." Bird et. al. (1975) report Moore (1962) as finding that *"there were more than 150 separate occurrences of variable extent up to 1,500 ha."*

Wyong District Forester, Charlie Mackowski (pers. comm.), noted that field work in the early 1990's had delineated 5,000 hectares of "Bellbird Dieback" on State Forests in the then Wyong District.

Forests NSW (Stone et. al. 1995) have identified significant areas of dieback in the Morisset, Bulahdelah, Gloucester, Taree, Wauchope, Kempsey, Walcha and Urbenville districts. Stone et. al. (1995) notes *"More recently, District staff have reported that affected areas are increasing in size and that previously unaffected areas are developing symptoms."*

In 2004 Forests NSW identified almost 20,000 hectares of the approximately 100,000 hectares of apparently susceptible forest types in an area of north-eastern NSW bounded by the Border Ranges, Richmond Ranges and Captains Creek as being affected by dieback attributed to BMAD (Wardell-Johnson et. al. 2006). The NSW Scientific Committee (2008) notes that:

> *Of the affected area, approximately one third (6511 ha) has been assessed as 'severe', with 'many dead trees, severe thinning of crowns, low stocking rate of susceptible species and greatly increased mesophyllic ground story vegetation including weeds such as lantana' (State Forests of NSW, 2004).*

Wardell-Johnson *et. al.* (2006) state

> *Bell Miner Associated Dieback (BMAD) is a significant threat to the sustainability of the moist eucalypt forests of north-eastern NSW and south-eastern Qld, and to biodiversity conservation at a national scale.*
>
> *...*
>
> *BMAD is a nationally significant conservation problem that has the potential to reduce the chances of achieving sustainable forest management in north-eastern NSW. There is a strong likelihood for significant biodiversity loss in the medium future in the general region, including south-eastern Qld, as well as reduced available timber volumes. Blaming Bell miners for the problem will not lead to its resolution.*
>
> *...*
>
> *The severity of the BMAD problem is such that tens of thousands of hectares in north-eastern NSW is currently affected with over 2.5 million hectares considered potentially vulnerable (Ron Billyard pers comm., Nov. 2004). A substantial (although uncertain) area of south-eastern Queensland is similarly affected, although less attention has been directed there. BMAD occurs on both public and private land and the area affected is expanding*

rapidly. The severe impact of this form of forest canopy dieback has profound implications for the conservation of the internationally significant biodiversity of the region.

There are numerous requirements for Forests NSW to redress dieback and restore degraded areas to a healthy and productive condition. The IFOA (2.7.1) requires that in carrying out forestry operations "SFNSW must give effect to the principles of ecologically sustainable forest management as set out in Chapter 3 of the document entitled, "ESFM Group Technical Framework".

The IFOA (4.26) also requires:

SFNSW must ensure that the scale and intensity at which it carries out, or authorises the carrying out of, forest products operations in any part of the Upper North East Region, does not hinder the sustained ecological viability of the relevant species of tree, shrub or other vegetation within the part.

Forests NSW's (2005) ESFM Plan identifies as policy:

Forests NSW will maintain or enhance the health and productivity of forests to support nature conservation, timber production and other ecologically sustainable uses in Upper North East (UNE) Region.

In relation to BMAD Forests NSW (2005) go on to state:

Chronic decline occurs when long term environmental changes, as a result of human management, impair tree health. It is increasing throughout dry and moist eucalypt forests, particularly in coastal areas. Approximately 20,000 ha of forest within UNE Region, including about 6,000 ha on State forest is showing signs of decline while a larger area of forest throughout the region is thought to be susceptible.

The RFA reviews recognize the significance of BMAD, The seriousness of BMAD is stated in the NSW & CoA (2009) 5 year review of the RFA:

The resultant cycle of tree stress commonly causes the eventual death of forest stands, and serious ecosystem decline. In NSW the potential impact of BMAD-induced native vegetation dieback represents a serious threat to sclerophyll forest communities, particularly wet sclerophyll forests, from Queensland to the Victorian border. The forests most susceptible to dieback are those dominated by Dunn's white gum (Eucalyptus dunnii), Sydney blue gum (E. saligna), flooded gum (E. grandis) and grey ironbark (E. siderophloia). There is also evidence that some normally non-susceptible dry sclerophyll types may be affected when dieback is extreme. Current estimates place the potential at-risk areas at a minimum of approximately two and a half million hectares across both public and private land tenures in NSW.

BMAD is emerging as a pressing forest management issue in both the UNE and LNE regions. The potential impacts include:

- *degradation of sclerophyll forest ecosystems across the UNE and LNE*
- *reduction in diversity and abundance of threatened flora and fauna species including Dunn's white gum and rufous bettong*
- *increased weed invasion and associated displacement of native forest species.*

Dieback-affected areas are located in the catchments of the major rivers of the North Coast of NSW including the Tweed, Richmond, Clarence, Macleay and Hastings. Maintenance of water quality in these river systems is critically dependent on maintenance of healthy forest

> *cover over the catchment uplands. Bell miner associated dieback has the potential to degrade these forests, and consequently impact negatively on rivers and catchment communities through increased sediment and nutrient loads, and increased frequency and intensity of flooding.*

The 2003/4 FA implementation report (NSW Government 2007) and DECCW (2010) echo these concerns and identify BMAD as *"a serious threat to sclerophyll forest communities, particularly wet sclerophyll forests".* The NSW&CoA (2009) 5 year RFA review identifies that BMAD *"is of prime concern in the northern forest regions of the state".*

The North East Forest Alliance has been pursuing the issue of Bell Miner Associated Dieback for over twenty years. We tried to get it addressed in the Environmental Impact Statements prepared in the early 1990s. This was a major issue we pursued when we were on the North East Harvesting Advisory Board in 1996/8. We unsuccessfully attempted to have this issue dealt with in the CRA process. We have been involved with the BMAD Working Group since early 2002.

While we recognise that we have made some progress over that time the condition of the forests has continued to decline, and Forests NSW are continuing to ignore and compound the problem in their logging operations. In their planning processes Forests NSW often don't recognise the presence of BMAD (i.e. Pugh 2012e), and when they do, they do not attempt to identify its extent or severity (i.e. Pugh 2009). When they do recognise its presence they actually often target affected areas for maximum utilisation logging.

A classic example of BMAD management was revealed in NEFA's audit of compartments 162 and 163 Yabbra State Forest (Pugh 2009). BMAD had been present at lower elevations in the area for over 30 years where there was a patchy dense lantana understorey due to past logging. The forest ecosystems most affected were Grey Box-Red Gum-Grey Ironbark, and Wet Bloodwood-Tallowwood, which have achieved 41% and 82% respectively of their national reservation targets (including in Informal Reserves and Protection by Prescription), along with the NSW Endangered Ecological Community *White Gum Moist Forest.*

The Scientific Committee note "'Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners' is identified as a threat to White Gum Moist Forest in the NSW North Coast Bioregion which is listed as an Endangered Ecological Community under the *Threatened Species Conservation Act* 1995". Numerous NSW listed threatened species occurred in the area, including the nationally endangered Spotted-tail Quoll and vulnerable Koala.

The Harvesting Plan for compartments 162 and 163 of Yabbra SF (4.2) states:

> *Lantana & shrubby understorey is providing conditions suitable for occurrence of Bell Minor* (sic) *Associated Dieback (BMAD). A significant section of the harvest area has been adversely affected. There are many dead stems and the crowns of some of the remaining trees are thin and appear unhealthy. BMAD affected areas will have unhealthy merchantable trees removed during this operation*.

This was the full extent of consideration of lantana and BMAD. There was no mapping of dieback areas, no assessment of severity, no consideration of amelioration measures to apply in dieback areas, nothing. Only a professed intent to apply what amounted to maximum economic utilisation in these areas – as most trees were unhealthy.

The Harvesting Plan identified the expected basal area (BA) removal to be 35%, acknowledging that *"BA removal will exceed 40% in some localised areas, but will be balanced by non harvest areas and tree retention across the tract"*. The prescription for the endangered Black-striped Wallaby (which had been recorded in both compartments) allowed for *"Removal of no more than 50% canopy cover in the net harvest area"* and required that Forests NSW to the *"greatest extent practicable, protect ground habitat from specified forestry activities"*. Other threatened species with specific tree retention requirements were Yellow-bellied Gliders (for which 32 records existed), Koalas and Glossy Black Cockatoo. There were also standard prescriptions for the retention of 10 hollow-bearing trees, 10 recruitment trees and 6 eucalypt feed trees per 2 ha.

PHOTOS: BELL MINER ASSOCIATED DIEBACK IN YABBRA SF, MEANT TO BE SUBJECT TO SINGLE TREE SELECTION AND 60% CANOPY RETENTION – INSTEAD LOGGED ON A MAXIMUM UTILISATION BASIS AND LEFT FOR DEAD.

The audit (Pugh 2009) reported that:

> *Most remaining healthy trees were removed from forests affected by Bell Miner Associated Dieback (resultant from previous logging operations), having significant degrading impacts on forest health, ecosystem functioning and viability, and forest productivity. Many retained affected trees had then succumbed to the hot post-harvest burn. This logging and "management" is clearly not in accord with any of the principles of ecologically sustainable forest management as defined in the IFOA (breaches IFOA conditions 2.7.1 and 4.26).*
>
> *Bell Miner colony establishment was noted to be widespread throughout Compartments 162 and 163 and appeared to have been favoured by the logging and burning operations. It can be expected that the threatening process associated with colonies of this species (BMAD) will cause further deaths of trees, severely retard forest recovery and result in the loss of substantial areas of threatened species' habitat in the mid to long-term.*

In EPA's response (DECCW, Simon Smith, 19/5/2010) they dismissed NEFA's concerns regarding BMAD on the spurious grounds that the logging, burning and subsequent weed proliferation that occurred within and adjacent to an existing BMAD area could not be proved to have affected it:

> *DECCW notes your concerns regarding Bell Miner Associated Dieback (BMAD) and the principles of ecologically sustainable forest management. It is noted however that the NSW Scientific Committee's determination in relation to broad-scale canopy dieback associated with psyllids and Bell Miners "involves interactions between habitat fragmentation, logging, nutrient enrichment, altered fire regimes and weed-invasion". The Scientific Committee's determination also notes that "at present, no single cause explains this form of dieback. And it appears that 'Forest eucalypt associated with over-abundant psyllids and Bell Miners' cannot be arrested by controlling a single factor". An Inter-agency BMAD working group is working to improve knowledge on the interrelation of land management activities and the prevalence of BMAD.*

The fact that the gross disturbance and the BMAD was affecting inadequately reserved forest ecosystems, the endangered ecological community *White Gum Moist Forest*, and known locations of the Endangered Black-striped Wallaby, vulnerable Yellow-bellied Glider, vulnerable Koala and vulnerable Brush-tailed Phascogale, appeared to be irrelevant to the EPA.

Despite BMAD and lantana being emphasized in our audit, and on a site inspection with Forests NSW's CEO Nick Roberts, in Forests NSW's (2010) subsequent "Rehabilitation and Monitoring Plan, Compartments 162 and 163 Yabbra State Forest No 394" there is no mention what-so-ever of the dieback issue, no delineation of problem areas, and no identification of rehabilitation measures relevant to the problem. There is no identification of problem and noxious weeds, not even a mention of Lantana. This plan was endorsed by the EPA (DECCW).

Three years after the logging most of the eucalypt trees retained in the logging area are now sick or dead and the once diverse rainforest and grassy understories have mostly been replaced by lantana. The lantana has effectively suppressed most regrowth of native species and this is unlikely to change while it retains dominance. Lantana and the associated Bell Miner Associated Dieback have expanded with every logging operation and have now spread across the whole logging area, causing dieback of eucalypts within areas excluded from logging. Ecosystem functioning and processes have been destroyed. Numerous threatened animals have been eliminated due to loss

of vital habitat requirements. The maximum utilisation logging practiced, the dieback of retained trees, and the suppression of regrowth, has destroyed any timber production potential.




PHOTOS. These were taken 3 years after the logging. The forest was once tall eucalypt forest, with a dense canopy, and stands of rainforests along creeks and on basalt at higher elevations. The understorey once varied from grassy patches at the lower elevation to diverse rainforest through most of the area. A few logging cycles have left a destroyed forest. The photos show that there has been death and sickening of retained trees, very little regeneration of eucalypts, rampant lantana growth, and patchy growth of crofton weed, wattles and White Cedar. Note that most of the visible understorey is lantana.

Forests NSW's trashing of this forest was an act of wanton vandalism. They knew this would be the outcome, and having destroyed it they then abandoned the forest to its fate. These forests are in need of extensive rehabilitation works to remove the lantana and establish regeneration.

The Inquiry needs to recognize that logging is facilitating the spread of weeds through our forests and that this is causing the degradation of ecosystems and the loss of habitat for numerous threatened species. The Inquiry needs to recommend that significant weed infestations are identified before logging and rehabilitation works implemented.

The Inquiry needs to recognize that Bell Miner Associated Dieback is a major threat to many forest ecosystems and threatened species over large areas of north-east NSW, and appears to be rapidly worsening. Tens of thousands of hectares of forest in north-east NSW are affected and hundreds of thousands of hectares are vulnerable. It is a serious threat that has been procrastinated over for far too long.

Forests NSW are targeting Bell Miner Associated Dieback Areas for removal of all healthy remaining trees and then abandoning them to their fate as destroyed ecosystems. The Inquiry is requested to support a sustainable approach to the key threatening process Bell Miner Associated Dieback by recommending an urgent moratorium on logging in and adjacent to BMAD areas until such time as effective rehabilitation strategies for restoration of ecosystem health and threatened species habitat are implemented.

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